Chapter 3

Affected Environment and Environmental Consequences

3.1 INTRODUCTION

Chapter 3 describes the physical, biological, and human resources of the environment that are likely to be affected by the alternatives presented in Chapter 2, and the environmental effects that the alternatives may have on those resources. Affected Environment and Environmental Effects have been combined into one chapter to give the reader and the decision-maker (responsible official) a more concise and connected depiction regarding the effects that the various alternatives would have on relevant resource issues identified in Chapter 2. There were no "significant" resource issues associated with any of the alternatives. Summaries of the direct, indirect, and cumulative effects of the alternatives on the various resources are outlined in this chapter.

3.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIVITIES

The Council on Environmental Quality (CEQ) regulations implementing NEPA require that federal agencies consider three types of actions: (1) ***connected actions***, which are two or more actions that are dependent on each other for their utility; (2) ***cumulative actions***, which when viewed with other proposed actions may have cumulatively significant effects, and should therefore be analyzed together; and (3) ***similar actions***, "which when viewed with other reasonably foreseeable or proposed actions, have similarities that provide a basis for evaluating their environmental consequences together." (40 CFR 1508.25(a))."

The agency is not required nor is there a benefit to a rendering of all effects from all actions that have impacted a particular resource regardless of whether the proposal under consideration contributed an additive effect. Recent guidance from the Council of Environmental Quality (CEQ), Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, (6/24/2005 states "Generally , agencies can conduct adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. "The environmental analysis required under NEPA is forward-looking, in that it focuses on the potential impacts of the proposed action that an agency is considering. Thus, review of past actions is required to the extent that this review informs agency decision making regarding the proposed action. This can occur in two ways. First, the effects of past actions may warrant consideration in the analysis of the cumulative effects of a proposal for agency action. CEQ interprets NEPA and CEQ's NEPA regulations on cumulative

effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects."

Historical Activity and Uses

Past activities within the analysis area include fire suppression, timber harvest and associated roadbuilding, wildlife management by permit, and livestock grazing that has been ongoing for the last 100 years. Fire suppression, along with grazing, altered plant communities' biomass production, species composition, and diversity. Conifers have encroached into non-forested areas historically kept from climax conditions with frequent fire. Noxious weeds were introduced and infestation levels have increased in some areas. Past logging and road building have also contributed to altered habitats in some areas of the allotments. Wildlife management of big game populations by permit has evolved to present day permits, seasons, and protections. All of these activities may disturb vegetation locally. These disturbances are small in scale and not usually long-term in duration.

Major fires occurred in the analysis area in the mid eighteen hundreds. Recent large wildfires in the analysis area include the Fridley Fire in 2001, which was approximately 24,000 acres and the Big Creek fire in 2006, which was approximately18,000 acres.

In 2001 approximately 15 miles of road within the Fridley Fire perimeter in the West Pine Allotment were decommissioned and rehabilitated. These activities included ripping, drainage, and seeding of 10.5 miles and recontouring of 4.5 miles of road.

In 1999, there was 2 miles of road decommissioning in the Rock Creek South Allotment to convert the use from a road to an ATV trail.

Past harvest activity on National Forest lands in the analysis area includes a total of approximately 600 acres in the late 1980s – 2004. There were no harvest activities in the Eightmile Allotment, 36 acres in the Rock Creek South Allotment in 1996, 270 acres in the Bald Knob Allotment between 1988 and 1999, and 285 acres in the West Pine Allotment in 1989 and from 2000-2004. The majority of these areas have been planted or have naturally regenerated.

Because fish habitat complexity was lacking in West Pine Creek in the West Pine Allotment due to the effects of the Fridley Fire of 2001, a habitat restoration project was implemented during the summer of 2007 to increase large woody debris in the lower reaches of this stream. The project was also intended to help stabilize channel changes occurring due to the lack of energy dissipation features.

Current Activity and Uses

The Bald Knob Allotment consists of intermingled National Forest System (NFS) and private lands with approximately 16% National Forest and 84% private lands. The allotment is currently being grazed with a Term On/Off Permit for a total of 10 head on the National Forest System lands and up to 150 head on private lands from 7/1 to 9/30 (an approximate total of 453 head months (HM) for the allotment). There are no specific grazing rotations for this allotment.

A land exchange in the Bear Canyon/Trail Creek area has been proposed between DePuy Enterprises and the Forest Service and is presently ongoing. One parcel identified to be exchanged is located on National Forest System lands that are within the Bald Knob Allotment. This parcel is as follows:

T.3S., R.7E., Principal Meridian, Park County, Montana

- Parcel 2: Section 27: Lots 1-4, W½E½, N½NW¼, containing 438.28 acres, more or less.

When the exchange is complete, the current permittee will have the option of either retaining grazing privileges on the involved Federal lands for a period of two years from the date of written notice, or waiving their privileges.

The West Pine Allotment is currently being grazed with a Term On/Off Grazing Permit for the grazing of 48 head on National Forest System Lands with up to 72 head and a Term Grazing Permit for 28 head not to exceed 92 days (approximately a total of 306 HM). Grazing is allowed between the dates of July 1st to October 1st annually with a deferred rotation grazing system.

The Eightmile Allotment consists of intermingled National Forest and private lands and consists of two units (Eightmile and Dry Creek). This allotment is currently being grazed with a Term Grazing Permit for 37 cow/calf pairs from 7/1 to 9/30 on National Forest lands and a Term Private Land permit for 19 head from 7/1 to 9/30 on private lands within the allotment. The Dry Creek unit of the allotment has been vacant since 2001.

The Eightmile Allotment includes one open road, North Dry Creek Road #2613. The North Dry Creek Road, within the allotment, is open to high clearance vehicles, ATVs and motorcycles from June 15 until September 5 each year as per the Gallatin National Forest Travel Plan of December 2006. The implementation of the Travel Plan is not yet complete and currently the road is still closed to motorized uses within the allotment boundary. Before the road will be opened to motorized uses a parking facility needs to be built in Section 30 and route marking signs need to be installed along the road in the Section 19 which is private land. The parking facility will include fencing, a cattle guard, and go-by gate. A cattle guard will also be installed where Road #2613 enters Section 19 on its northern boundary if necessary.

The Rock Creek South Allotment has been vacant for approximately 12 years with the grazing permit having been waived back to the FS.

Private residences are concentrated in a subdivision adjacent to the Rock Creek South Allotment. There are no subdivisions located in the other allotments. There a few scattered residences and ranches in these allotments.

The Bald Knob allotment is completely surrounded by private land and lacks public recreational access. The West Pine, Eightmile, and Rock Creek South Allotments include both public and private lands. Public access via roads and/or trails is available in all three of these allotments. The road network in West Pine Creek and Eightmile allotments is popular with motorized users and those looking for dispersed campsites. The trails in these allotments are non-motorized trails and are predominately used by hikers and stock users during the fall hunting seasons.

Trailheads and roadsides, as well as other known noxious weed infestation areas are currently being chemically treated annually as a part of the regular district noxious weed program.

Potential Future Activity and Uses

Livestock grazing is proposed to continue under the conditions described in the action alternatives. Weed treatments will continue as a part of the regular district weed management program. Recreation in the form of camping, hiking, fall hunting, trail riding, and backcountry driving will likely continue.

The East Zone Gallatin Fire and Fuels organization is anticipating a proposal, in the near future, to apply prescribed fire applications and/or hand thinning in portions of some of the allotments and adjacent areas that are outside of their normal fire return intervals including: grass, brush, and forest vegetation types. Prescribed fire applications would be designed and implemented in such a way to provide for minimal impacts to other resource areas and would be implemented in either spring or fall. More in-depth modeling of the vegetation types in question, as well as on the ground inspections would be completed to determine actual treatment areas. All potential units would be burned in a mosaic pattern and could be implemented for a multitude of resource objectives such as: fuel reduction, to improve forest health, expand public safety, to enhance important grass and sage environments, as well as, maintaining important wildlife habitats.

Other reasonably foreseeable actions that may occur in the project area on private lands include increased subdivision and private land development. Private landowners will continue to conduct agricultural activities such as farming and ranching. Grazing by wild ungulates will continue, as will the hunting seasons managed by the State of Montana Department of Fish, Wildlife, and Parks. No specific areas have been identified for these activities at this time. The Forest Service has no control over these types of activities occurring on private land.

3.3 AFFECTED ENVIRONMENT & EFFECTS ANALYSIS

This section describes the environment surrounding the Bald Knob, West Pine, Eightmile, and Rock Creek South Allotments that may be affected by the proposed action or its alternatives. It includes a discussion of natural resources, Forest Plan goals and objectives, and other management activities.

A. Water Quality and Fisheries Habitat

Resource Issue A pertains to the effects that the various alternatives would have on aquatic and water resources the West Paradise Allotments. Affected environment descriptions and effects analyses are based on field reviews of the allotments, fish habitat and population surveys, and other resource documentation. This analysis addresses aquatic, water quality, and riparian issues identified for each allotment. The primary issues of concern are related to livestock usage of riparian areas as well as the potential for livestock trampling of spawning redds. Livestock use of riparian areas, including altering vegetative conditions and trampling streambanks, may result in bank and channel stability problems, increased sediment, and undesirable changes to stream channel form and function. For streams that support fish, these changes can result in degraded fish habitat and population declines.

Grazing management methods , which were designed primarily for upland areas have altered many riparian areas and their associated stream characteristics. Poor grazing management practices can cause direct mechanical damage (i.e., trampling streambanks) that changes the dimensions, pattern, and stability of alluvial channels. Improper grazing can also change the vegetative composition of riparian communities, resulting in changed rooting depth, rooting character, surface protection, bank stability and aquatic habitat. Many of these changes cause adverse stream channel adjustments. Depending on the type of channel and its sensitivity to disturbance, these adjustments can include:

1) Accelerated bank erosion
2) Increased width/depth ratios
3) Altered channel patterns
4) Induced channel instability
5) Increased sediment supply
6) Decreased sediment transport capacity
7) Damaged fisheries habitat.

Trampling of spawning redds by livestock could cause direct mortality of incubating fish eggs and thus reduce recruitment success, fish numbers, or species viability. Recent studies have shown that redd trampling by cattle in some streams can significantly impact spawning redds and incubating eggs (need a reference). The issue may or may not be relevant to allotment streams depending on several factors. First, cattle must have access to a stream in question, and access must be to stream reaches where fish spawning occurs. In many allotment streams or stream reaches on

the east side of the Gallatin National Forest (GNF), cattle access is limited or precluded by topography or dense riparian vegetation. Likewise, there may or may not be suitable forage along a riparian corridor, which may influence cattle use. When evaluating affects of redd trampling, direct mortality of incubating eggs via trampling should be considered in the context of other compensatory mortality mechanisms in order to determine affects to the population as a whole. For example, population studies in streams throughout allotments in the Upper Shields drainage, GNF, showed that adult habitat availability was the primary factor limiting the number of adult spawning fish. In many streams, numbers of young-of-the-year fish were high, suggesting high recruitment success, but numbers of adult fish were extremely low and found only near suitable adult habitat. As such, mechanisms other than recruitment (e.g., adult habitat availability) were influencing numbers of adult fish. In those cases, redd trampling would be expected to have minimal influence on the population as a whole.

Cattle access to all fish bearing streams in the West Paradise Allotments is minimal. For streams supporting Yellowstone cutthroat trout in the Rock Creek, Donahue Creek, and West Pine drainages, redd trampling is not a significant issue because cattle access to those streams is limited or precluded. For all streams surveyed, the potential for redd trampling is minimal or non-existent. Therefore, this issue is dismissed from further detailed study in this analysis.

Scale of Analysis

Temporal Bounds: The temporal bounds for analyzing cumulative affects on fisheries and aquatic resources for this project includes the period for which listed past, present, and reasonably foreseeable activities have or will occur. Past activities include historic timber harvest which has influenced LWD frequencies in some streams and thus channel stability, livestock grazing, recent fires, and foreseeable prescribed fire.

Spatial Bounds: The spatial bounds for cumulative affects on fisheries and aquatic resources include streams within the allotment boundaries. Livestock grazing has had minimal impact on aquatic resources including habitat. Grazing affects on streams are socialized.

Affected Environment

Streams have considerable variability in their inherent sensitivity to disturbance, the role that riparian vegetation plays in maintaining their stability, and the ability to recover from grazing induced damage. Some stream or channel types are inherently very stable and not susceptible to grazing impacts, while other channel types can be significantly altered. Thus, it is important to understand the sensitivity of individual streams in order to evaluate past, present and future grazing affects on channel stability and fish habitat quality. The affected environment descriptions include a channel type and sensitivity analysis.

Likewise, depending on topography and vegetative patterns throughout the allotments, cattle may or may not use riparian corridors along various stream segments. In some cases, the stream or stream reaches may be inaccessible due to steep topography. In others, the lack of suitable forage along stream reaches may avert cattle occupancy along riparian corridors. In other cases, the primary grazing areas may be within riparian corridors, or riparian corridors may be used as access routes to suitable rangeland. Thus, in order to evaluate potential stream and riparian related grazing effects within an allotment, it is important to know what reaches of the streams in question, receive continuous or transitory use.

The Forest plan (MA7) requires the GNF to "manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows (Forest Plan page III-21)". Monitoring Item #5 in the Forest plan monitoring requirements (Forest Plan Table IV-1, page IV-5) lists two guidelines which relate to limits of cumulative allowable management caused change to sediment filtration (i.e., more than a 25% loss in effective streambank cover), and stream channel stability. These guidelines are compared with monitoring data to determine whether the narrative standard above is being met.

Surveys for streams within the allotments have been conducted, with the most recent surveys in 2007. The 2007 surveys were conducted specifically to determine the extent of grazing related riparian/channel stability impacts and conformance with the existing Forest Plan standards and guidelines. The Proper Functioning Condition (PFC) evaluation procedure (Prichard, 1998) was used in 2007 for allotment streams.

The functioning condition of riparian-wetland areas is a result of interactions among geology, soil, water and vegetation. The Proper Functioning Condition (PFC) evaluation is a qualitative method for assessing the condition of riparian-wetland areas that considers hydrology, vegetation, and erosion/deposition attributes and processes. The method assesses how well these processes are functioning. The PFC technique evaluates these interacting natural forces to arrive at a “PFC” determination. PFC determinations were made for streams throughout the allotments. If a stream is in properly functioning condition (or at PFC), it is considered to be resilient enough to allow a riparian-wetland area to hold together during high flow events with a high degree of reliability. This resiliency also allows an area to then produce desired values, such as fish habitat, forage, and habitat for other riparian dependent species. It does not mean that the stream is in pristine condition. Potential Natural Condition (PNC) defines nearly pristine conditions. If a riparian-wetland area is not in PFC or is not “properly functioning”, it is placed into one of three other categories:

Functioning At Risk–Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.
Nonfunctional – Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality etc…
Unknown – Riparian-wetland areas that managers lack sufficient information on to make any form of determination.

PFC evaluations for some stream reaches were completed using existing file data, photos, personal observations and knowledge of streams in the project area as indicated in Table 3-3.

Channel Type, Channel Stability, Habitat Descriptions, and Fish Populations

Bald Knob Allotment

The Bald Knob Allotment analysis area on National Forest includes a ½ mile reach of Browns Gulch which is a headwater tributary to Trail Creek, and a ¼ mile reach of a small unnamed tributary to Browns Gulch. Both streams are small 1st order streams with no fishery potential because of limited streamflow and/or higher gradients. The riparian corridors of both streams are not identified as suitable range because the majority of riparian zones are heavily forested. Browns Gulch and the unnamed tributary have A5 channel types (Rosgen 1996), with an extremely high sensitivity to disturbance, very poor recovery potential, very high sediment supply, and very high streambank erosion potential. Riparian vegetation typically exerts negligible controlling influence on channel stability. As such, the primary grazing related cause for potential change would be streambank trampling.

The entire lengths of both streams within the allotment were surveyed in 2007 and field notes indicate that cattle related impacts were not evident. PFC summary notes detail that all attributes contributing to the PFC rating were properly functioning and near pristine condition (PNC). Nearly 100% of the banks were covered with riparian species including moss, horsetail, spruce and alder with several seral stages represented. Spruce and alder were the dominant woody species. Large woody debris was abundant in the channel, and there was no evidence of lateral movement, or downcutting. There was no evidence of bank trampling or cattle related erosion. Both stream reaches were judged to be well within Gallatin NF channel stability and riparian filtration guidelines. The 2007 PFC rating showed the streams are in properly functioning condition and fully meet their desired condition and all forest plan standards relative to habitat management goals and grazing.

Fish population surveys were conducted for both streams in July 2007 using backpack electrofishing gear. No fish were found in either streams, presumably due to low stream flow, high gradients, and limited suitable habitat.

West Pine Allotment

The West Pine Allotment analysis area includes approximately 1 mile of West Pine Creek, which is a perennial 2nd and 3rd order tributary to Trail Creek, approximately 1 mile of the North Fork of West Pine Creek, which is a small second order tributary to West Pine Creek, and a small 1st order unnamed ephemeral tributary entering West Pine Creek from the south.

West Pine Creek: West Pine Creek proper in the allotment was surveyed in 2007 in the southeast 1/4 of Section 5. The channel type is a B4, with predominately gravel and cobble substrate. B4 channel types have moderate sensitivity to changes in streamflow and sediment discharge, excellent recovery potential, moderate sediment supply, and low streambank erosion potential. Riparian vegetation exerts moderate to low controlling influence on streambank stability. The riparian corridor is vegetated with predominately conifers, alders and understory grasses and forbs. Riparian grazing occurs intermittently along reaches were suitable forage exists.

Survey results during summer 2007 showed that cattle related impacts were minor, with some forage utilization and browsing of woody species. There is little suitable forage in the riparian zone as a whole, but cattle do concentrate along short reaches of the riparian corridor near the forest boundary, seeking shade and water. Access to the stream is limited to areas with less dense alder. In areas where cattle do concentrate or trail along the stream, some bank trampling is evident. However, surveys in 2007 show that trampling affects along the reach as a whole were minor. The 2007 PFC rating resulted in a Functioning at Risk designation with an upward trend, and was primarily due to channel stability departures from natural condition attributed to post fire flood events and instability related to lack of LWD. The FAR rating was partially attributed to intermittent grazing impacts along the lower reach near the forest boundary.

The West Pine Creek drainage has historically been subject to riparian timber harvest, which influenced the amount of large woody debris (LWD) in the channel. LWD in high gradient mountain streams provides flow obstructions that slow the rate of channel and bank erosion during extreme flood events. During flood events, stream energy that would otherwise be dissipated against instream LWD is dissipated against the

bed and banks of the channel causing significant bed and bank erosion. In several locations throughout West Pine Creek, the channel incised over 5 feet during flood flows in July 2002 following the Fridley Fire of 2001. Instream woody debris also creates complex and diverse pool habitat that is critical for all life stages of fish. Because fish habitat complexity and diversity was lacking in West Pine Creek, a habitat restoration project was implemented during summer 2007 to increase the amount of LWD in lower reaches of the stream. The project was also intended to stabilize channel changes occurring because of the lack of energy dissipation features.

Prior to the Fridley Fire, West Pine Creek supported a pure population of Yellowstone cutthroat trout (YCT) upstream of a culvert near the national forest boundary. Downstream from the culvert, genetic analysis showed hybridization with rainbow trout. YCT is considered a sensitive fish species in Region 1 of the Forest Service and a species of special concern by the Montana Fish, Wildlife and Parks. Population surveys immediately after the fire revealed that all fish were extirpated in upstream reaches on National Forest. Follow-up surveys in 2002 through 2005 revealed that YCT from the downstream unaffected reach had not repopulated the fire affected reach upstream. A survey done in 2007 revealed that rainbow/cutthroat trout hybrids have begun to repopulate the fire affected reach. Ten fish were captured in a 200 meter reach upstream from the national forest boundary. MDFWP is planning on suplementing the population by stocking genetically pure YCT from a wild brood during summer 2008.

North Fork West Pine Creek: The North Fork of West Pine Creek is a small 2nd order tributary to West Pine Creek with perrenial streamflow and no fishery potential because of steep gradients, limited streamflow and limited fish habitat conditions. It is a B4a channel type inside a G4. This typically occurs when channels begin to adjust and stabilize following a severe flood event. Following the Fridley Fire, extreme channel changes occurred in the North Fork West Pine Creek, with extensive doncutting. This downcutting resulted in an unstable G4 channel type. A steep B4 channel has begun to develop inside the G4, which suggests recovery is occuring. Riparian vegetation consists primarily of cottonwood, aspen and alders with underlying shrubs and forbs. A PFC survey completed in 2007 determined that the stream was functioning at risk with an upward trend, but variables contributing to the FAR rating were not related to grazing. The FAR rating was primarily due to channel stability departures from natural condition attributed to post fire flood events and instability related to lack of LWD. Shrub vigor and age class diversity were also lacking.

Electrofishing surveys were conducted in the North Fork West Pine Creek suring summer 2008 and no fish were found. Fish inhabitance is likely limited by low streamflow and high gradients.

Eightmile Allotment

The Eightmile Allotment includes approximately 2 miles of Eightmile Creek on its southern boundary and approximately 2.5 miles of Dry Creek to the northeast.

Eightmile Creek: Eightmile Creek constitutes the single largest source of water in the allotment; however, steep topography and heavy downfall timber excludes cattle from all but approximately 200 feet of stream in Section 26. This reach of stream was surveyed in 1995 and again during summer of 2007 to determine cattle related impacts. The 200' reach of Eightmile is classified as a C4b channel type (Rosgen 1996). In general, C4 channel types have a very high sensitivity to disturbance, good recovery potential, a high sediment supply, very high streambank erosion potential, and a very high vegetation controlling influence. Rosgen 1996 noted that C4 channel types high a very high sensitivity to grazing and that consequences of cattle related change can be high. Riparian vegetation at this site consists primarily of grasses with some sedge along the channel. During both the 1995 and 2007 surveys, there was no evidence of recent cattle use or recent or historic impacts. The channel above the C4 reach is a B3/B4 that is stable with high frequencies of LWD. Cattle cannot access this reach and there is no suitable forage along the riparian corridor. The 2007 PFC rating showed the entire stream is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to fish habitat management goals and grazing.

Eightmile Creek is inhabited by both Yellowstone cutthroat trout in lower reaches below the National Forest boundary, and eastern brook trout in upstream reaches. Population surveys conducted in the early 1990's revealed extremely low densities of brook trout throughout the national forest reach (e.g., 2 fish were found in approximately 1 mile surveyed). During electrofishing surveys in summer 2007, 28 brook trout were captured in a 100 meter reach above the private land boundary. The increased fish biomass is likely do to increased water temperatures and stream productivity following the Fridley Fire. No YCT were found.

Dry Creek: Dry Creek is a small 2nd order tributary to Trail Creek, but the stream within the allotment has intermittent streamflow. During low water years, the stream in the allotment can dry up. Suitable forage exists along the riparian corridor in Section 19 (private) and grazing occurs periodically when there is water. In addition, there is a 1st order tributary lower in the drainage, upstream from the trailhead facility that is also

ephemeral. Like the headwater reach, grazing does occur when there is water in the stream.

Both reaches flow through moderate (B4) to steep (B3a) topography, are moderately entrenched with a moderate gradient and very stable plan and profile. They are riffle dominated with infrequently spaced pools formed by large woody debris. The upper reach is characterized as predominately a B3a channel type (>4% slope), with cobble substrates. The lower 1st order tributary has a B4 channel type with predominately gravel substrates. Both channels are inherently stable with a low (B3a) to moderate (B4) sensitivity to changes in streamflow or sediment discharge (Table 3-2; Rosgen 1996). They have a low to moderate sediment supply, low streambank erosion potential, and moderate riparian vegetation controlling influence (see Table 3-2). Under certain conditions, B3 and B4 type channels can have a moderate to high sensitivity to grazing impact depending on riparian vegetation composition, soil type, bank angle and rock content (Rosgen 1996). Cattle concentrations and season of use can also determine severity of potential grazing impacts for B3 and B4 channels. Riparian vegetation along the upper stream corridor consists of dense conifers with mostly native understory shrubs and grasses. Banks are well vegetated with dense root masses. They are very stable with a high rock content and little evidence of erosion. The banks have a relatively low bank angle with high erosional resistance. The 2007 PFC rating showed the upper reaches is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to habitat management goals and grazing. Because of low and intermittent stream flows, Dry Creek does not support a fish population.

The lower reach is less stable with lower bank rock content, steeper bank angles, and lower erosion resistance. Riparian vegetation consists of non-native grasses with lower root mass and decreased ability to hold banks together during high streamflows. Historic riparian harvest has occurred and may also be influencing channel stability. Some shrubs and aspen are present; however, vigor and age class diversity is lacking. The 2007 PFC rating showed the stream is functioning at risk with an upward trend. The FAR determination was primarily due to reduced shrub vigor and age class diversity.

Rock Creek South Allotment

Rock Creek: Rock Creek forms the southern boundary of the Rock Creek South allotment. No suitable rangeland exists along its entire length, and cattle access is precluded by steep topography and dense coniferous forest. The stream flows through moderate to steep topography; it is moderately entrenched with a moderate to high gradient and has a very stable plan and profile. It is riffle dominated with frequently spaced pools formed by large woody debris, boulders, and some bedrock outcrops. The channel is characterized as predominately a B2a channel type with some steeper A2 reaches throughout, with predominately boulder and large cobble substrates. There are short B3 (cobble) reaches interspersed throughout as well. All channel types are inherently stable with a very low sensitivity to changes in streamflow or sediment discharge (Table 3-2; Rosgen 1996). They have a very low streambank erosion potential, and riparian vegetation exerts negligible controlling influence on bank stability. Riparian vegetation along the stream corridor consists of dense conifers with mostly native understory shrubs and grasses. Banks are well vegetated with dense root masses. They are very stable with a high rock content and little evidence of erosion. With the exception of infrequently spaced meander bends with a high bank angle, most banks have a relatively low bank angle with high erosion resistance. The riparian corridor is vegetated with predominately conifers with understory shrubs. The allotment has been vacant for several years and survey results during summer 2007 showed that past cattle related impacts were not evident. The 2007 PFC rating showed the stream is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to fish habitat management goals and grazing.

Stoughten Creek: Stoughten Creek is a small 2nd order tributary to Rock Creek with headwater reaches within the allotment. Little suitable rangeland exists along the riparian corridor, except for a few small isolated meadows on hill slopes near the stream. The stream flows through moderate to steep topography, it is slightly entrenched with a low to moderate gradient and has a very stable plan and profile. It is riffle dominated with frequently spaced pools formed by large woody debris. The channel is characterized as predominately a B4 (cobble and gravel dominated) stream with interspersed gravel and sand dominated (B5) reaches. Both channel types are inherently stable with a moderate sensitivity to changes in streamflow or sediment discharge (Table 3-2; Rosgen 1996). They have a moderate sediment supply, low to moderate streambank erosion potential, and moderate riparian vegetation controlling influence (see Table 3-2). Under certain conditions, B4 and B5 type channels can have a moderate to high sensitivity to grazing impact depending on riparian vegetation composition, soil type, bank angle and rock content (Rosgen 1996). Cattle concentrations and season of use also determine severity of potential grazing impacts for B4 and B5 channels. Riparian vegetation along the stream corridor consists of dense conifers with

mostly native understory shrubs and grasses. Some reaches have dense alders. Banks are well vegetated with dense root masses and are very stable with little evidence of erosion. Cattle related impacts were not observed. Banks have a relatively low bank angle with high erosional resistance. The 2007 PFC rating showed the stream is properly functioning and is near pristine condition. The stream fully meets its desired condition and all forest plan standards relative to fish habitat and grazing.

Fisher Creek: Fisher Creek is a 2nd order perennial tributary to Rock Creek with limited suitable forage along the riparian corridor. Grazing occurs along some reaches when the allotment is active, but topography and dense vegetation precludes access to the majority of the stream. The stream flows through moderate to steep topography, is moderately entrenched with a moderate gradient and very stable plan and profile. It is riffle dominated with frequently spaced pools formed by large woody debris. It is characterized as predominately a B3a channel type (>4% slope), with cobble substrates. The channel is inherently stable with a low sensitivity to changes in streamflow or sediment discharge (Table 3-2; Rosgen 1996). It has a low sediment supply, low streambank erosion potential, and moderate riparian vegetation controlling influence (see Table 3-2). Riparian vegetation consists of dense conifers or alders with mostly native understory shrubs and grasses. Banks are well vegetated with dense root masses. They are very stable with high rock content and no evidence of erosion. The banks have a relatively low bank angle with high erosional resistance. Fish populations were not monitored, but it is assumed that the stream does support a population, especially in the lower reach near its confluence with Rock Creek. The 2007 PFC rating showed the stream is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to fish habitat management goals and grazing.

***Donahue Creek*:** The headwater reach of Donahue Creek within the allotment is an ephemeral 1st order stream. Donahue Creek is a tributary to the Yellowstone River. It has limited suitable forage along its riparian corridor in the allotment. Grazing occurs along some reaches when the allotment is active, but topography and dense vegetation precludes access to the majority of the stream. The stream flows through moderate to steep topography, is moderately entrenched with a moderate gradient and very stable plan and profile. It is riffle dominated with frequently spaced pools formed by large woody debris. It is characterized as predominately a B2a channel type (>4% slope), with cobble substrates. The channel is inherently stable with a very low sensitivity to changes in streamflow or sediment discharge (Table 3-2; Rosgen 1996). It has a very low sediment supply, very low streambank erosion potential, and negligible riparian vegetation controlling influence (see Table 3-2). Riparian vegetation consists of dense conifers or alders with mostly native understory shrubs and grasses. Banks are well vegetated with dense root masses. They are very stable with a high rock

content and no evidence of erosion. The banks have a relatively low bank angle with high erosional resistance. The 2007 PFC rating showed the stream is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to habitat management goals and grazing. Ephemeral streamflow in Donahue Creek proper within the allotment precludes fish inhabitance; however, lower reaches outside the allotment support a genetically pure population of Yellowstone cutthroat trout.

Unnamed Tributary to Donahue Creek: An unnamed perennial tributary to Donahue Creek flows through the south half of Section 2 on national forest. The stream is a C3b channel type with a low to moderate sensitivity to disturbance, good recovery potential, moderate sediment supply, moderate streambank erosion potential, and a very high vegetation controlling influence. Rosgen 1996 noted that C4 channel types high a very high sensitivity to grazing and that consequences of cattle related change can be high. Riparian vegetation at this site consists primarily of spruce and alder overstory with understory shrubs and sedge along the channel. During 2007 survey, there was no evidence of recent cattle use or recent or historic impacts. There was little suitable forage and cattle access was limited by dense vegetation. The 2007 PFC rating showed the entire stream is in properly functioning condition and fully meets its desired condition and all forest plan standards relative to fish habitat management goals and grazing.

Rock Creek south and Donahue watersheds provide substantial habitat for Yellowstone cutthroat trout, which is considered a *Species of Special Concern* by the Montana Department of Fish, Wildlife, and Parks and a *Sensitive Species* by the Forest Service. The current geographic distribution of "genetically pure" YCT encompasses less than 10% of their historic range. There are 36 remaining populations throughout their entire historic geographic range, most of which are isolated with little potential for genetic exchange, which contributes to their decline. Populations in both Rock and Donahue creeks are physically isolated from the Yellowstone River. A railroad culvert barrier in Rock Creek near its confluence with the Yellowstone River prohibits movement of fluvial Yellowstone River spawning fish. This isolation from other non-native trout species, which can either hybridize with YCT or displace through competition, is considered the primary reason why the Rock Creek drainage still supports an unhybridized YCT population. Likewise, the Donahue Creek population is isolated due to steep gradients near its confluence with the Yellowstone River, and because of stream dewatering for irrigation. Both populations are considered to be Core Conservation populations, and extremely important to conservation and recovery of the species.

Table 3-1, below outlines management objectives for allowable substrate sediment and sediment delivery levels for streams on the Gallatin National Forest by stream category. Table 3-2 outlines management interpretations of stream channel types from Rosgen 1996. The streams in the analysis area are characterized relative to the above discussion in Tables 3-2 through 3-4.

Table 3-1 Substrate Sediment & Sediment Delivery by Forest Stream Category

Category Grazing Sensitivity Level	Management Objective % of reference*	% Fine Substrate Sediment (<6.3mm)	Annual % > Reference** Sediment Delivery
Class A Sensitive Species and/or Blue Ribbon fisheries	90%	0 – 26 %	30%
Class B Regionally or locally important fisheries and all other streams (formerly Classes B,C,D)	75%	0 – 30 %	50%

*% of reference = % similarity to mean reference condition

**Reference = observed relationship between substrate % fines and modeled sediment delivery in reference (fully functioning) GNF watersheds.

Table 3-2-Management Interpretations of Channel Types (from Rosgen 1996).

Stream	Location UTM	Stream types	Sensitivity to watershed disturbance[a]	Recovery potential[b]	Sediment supply[c]	Streambank erosion potential	Vegetation controlling influence[d]
Bald Knob Allotment							
Browns Gulch tributary	**5043811N 512337E**	A4	extreme	very poor	very high	very high	negligible
Browns Gulch	**5043690N 512484E**	A5	extreme	very poor	very high	very high	negligible
West Pine Allotment							
West Pine Cr	**5040065N 518459E**	B3/B4	low/moderate	excellent	moderate	low/moderate	moderate
North Fork W Pine Cr	**5040095N 518626E**	B4a inside a G4	extreme	very poor	very high	very high	negligible
Eightmile Allotment							
Eightmile Cr	5032245N 515858E	C4b	very high	good	high	very high	very high
Eightmile Cr	5032216N 515913E	B3/B4	moderate	excellent	moderate	low	moderate
Dry Creek	5035913N 516600E	B3a	low	excellent	low	low	moderate
Dry Creek	5037213N 518992E	B4	moderate	excellent	moderate	low	moderate
Rock Creek South Allotment							
Rock Cr	5007505N 500268E	B2a	very low	excellent	very low	very low	negligible
Rock Cr	5007616N 500795E	B2a	very low	excellent	very low	very low	negligible
Rock Cr	5007769N 501276E	A2	very low	excellent	very low	very low	negligible
Donahue Cr	5012102N 503795E	B2a	very low	excellent	very low	very low	negligible
Unnamed trib to Donahue	5010850N 503474E	C3b	moderate	good	moderate	moderate	Very high
Stoughten Cr	5009421N 502189E	B4/B5	moderate	excellent	moderate	moderate	Moderate
Fisher Cr	5008732N 500604E	B3a	Low	excellent	low	low	Moderate

[a] Includes increases in streamflow magnitude and timing and/or sediment increases

[b] Assumes natural recovery once cause of instability is corrected

[c] Includes suspended and bedload from channel derived sources and/or from stream adjacent slopes.

[d] Vegetation that influences width/depth ratio stability

Determining Desired Future Condition

The Gallatin Forest Plan includes a programmatic Desired Future Condition (DFC) statement related to Forest wide grazing. The DFC is "improved range management practices will be initiated to improve wildlife habitat in livestock grazing allotments on wildlife winter ranges and riparian areas (Forest Plan page II-12)." It includes site- specific descriptions for desired riparian conditions. DFC's reflect the capability of the landscape, the various laws and regulations that apply to an area, and the values, or "products" that are desired. In other words, DFC's are portrayed through descriptions of how an area would look and function.

The concept of proper functioning condition (PFC) of riparian areas has recently surfaced as guidance for the management of riparian areas on public lands and can be used to help describe the DFC of a particular riparian area. PFC entails maintaining the physical components of riparian areas in a fashion that dissipates stream energy, filters sediment, retains floodwaters, and develops root masses (BLM, 1993). In most cases the DFC for a stream or stream reach will fall somewhere between a minimum of PFC (Functional –At Risk, with an upward trend) and a maximum of Potential Natural Condition (PNC). Potential Natural Condition would reflect the streams full habitat potential.

Desired future conditions also incorporate forest plan standards and guidelines relative to streambank stability (i.e., meet all standards and guidelines), and fish habitat management guidelines found in Table 3-3. DFC's are established for all streams throughout the allotment. However, for most streams throughout the analysis area, the existing condition of stream attributes that have potential to be influenced by grazing are already meeting the desired future condition (see Table 3-4). As such, a change in grazing management is not necessary to meet the DFC's.

The following analysis procedure is used to prescribe and direct grazing management changes in streams that do not meet DFC because of grazing related impacts. It is important to note that other land-use practices in the analysis area have contributed in one or more ways to degraded conditions in some areas. For example, riparian timber harvest has reduced the amount of LWD in West Pine and Dry creeks. A change in grazing management would not improve degraded conditions caused by these other land uses. As such, the DFC descriptions in Tables 3-3 through 3-5 of this report are specifically related to stream habitat attributes that are influenced by cattle grazing (e.g., riparian vegetation, bank stability etc.).

Developing Allowable Annual Forage Use Levels and/or Allowable Annual Streambank Alteration

The process outlined here for determining and implementing allowable use of grass and woody vegetation, or determining allowable streambank alteration on

an annual basis within riparian areas is designed to move toward or maintain desired future condition (DFC). The determination of annual use levels is based on an assessment of the following:

1) Sensitivity to Disturbance (Inherent Stability)

Streams: Rosgen Channel Type A (3, 4, 5, 6), C (3, 4, 5, 6), D (3, 4, 5, 6), E (3, 4, 5, 6), F (3, 4, 5, 6) and G (2, 3, 4, 5, 6). These have a low threshold for annual disturbance; likely limiting factor is streambank alteration.

Vegetation: Stability ratings from standard publications; (Rosgen Channel types A1, A2, B1, B2, B3, C1, C2, F1, F2; vegetation use may be the limiting factor).

Channel types, riparian vegetation, soil sensitivity, and the influence riparian vegetation has on maintaining channel stability. Channel type and sensitivity analyses are combined with knowledge of vegetative community types and the relative influence riparian vegetation has on streambank stability to determine "inherent stability".

2) Recovery Potential (Resiliency) (H, M, L)

Streams: Rosgen Channel Type (H=A1, A2, B1, B2, B3, C1, C2; M=G1, C3, E3, C4, C6, E4, E5, E6, F1, F2, G2, C5, F6; L=all others).

Vegetation: Deeply rooted perennials have higher resiliency than weakly rhizomatous grasses. After they are disturbed, riparian areas vary in their ability to recover. This is generally a function of soil characteristics and nutrient regimes.

3) Similiarity to Desired Future Condition (H, M, L)

Structure (both vegetation and stream profile)
Function (PFC data for vegetation and stream)
Composition (vegetation)

Assessing "similarity" to DFC provides a starting point from which success or trends can be measured. Similarity to DFC may have a vegetation community type component or channel morphology component, or both. The riparian vegetation component may consider community types (e.g., the existing community may be comprised of species that may or may not be consistent with a desired community type). Likewise, the desired species composition may exist, but health and vigor may not be at DFC. Channel changes could include deviations from a stable to a degraded channel, and may be reflected in gross channel type deviations, or minor deviations from desired channel morphology (e.g., increased channel widths due to grazing or reduced channel depths).

4) Relative Resource Values

In this case, streams that contain threatened, endangered or sensitive fish species, popular sport fisheries, municipal water supplies, etc. would be considered to have higher values than streams that do not have these attributes. Because of these variations, some streams receive special management emphasis to either protect important values or move a stream that is not at DFC in that direction. To aid in that effort, streams within the allotment were stratified into Class A or Class B streams according to Table 3-1. The sensitivity level is used to help determine acceptable levels of change (i.e., allowable streambank alterations, changes in vegetative communities). This determination gives a manager the option of maintaining a stream at ≥75% of its potential to ≥90% of its potential. These management objectives are consistent with Standard M-1 described above.

Depending on these characteristics of the channel type and riparian vegetation, physical and/or vegetative parameters may play a more or less important role in achieving DFC. It is necessary to determine which parameters (i.e., forage utilization or streambank alteration or both) are important to regulate such that the trend toward DFC is positive or that DFC is maintained over time. Once the critical parameter(s) is determined, appropriate use levels for those parameters can be established.

These physical or vegetative parameters then become a "limiting" parameter for a stream or a reach of stream. For example, allowable levels of streambank alteration may be a trigger point for moving cattle and may be initiated before allowable forage utilization levels are met. In this example, allowable levels of streambank alteration are the limiting factor and the most important component in moving a stream or stream reach toward DFC.

The streams in the analysis area are characterized relative to the above discussion in Tables 3-1 through 3-5. Table 3-1 outlines allowable sediment levels by Forest stream category. Table 3-2 outlines management interpretations of channel types according to Rosgen 1996. Table 3-3 oulines the Proper Functioning Condition (PFC) status, Rosgen channel type, channel stability departure (L = low, M = moderate, H = high), existing and desired vegetation community type, existing similarity to desired future condition (DFC), and sensitivity level of allotment streams. Table 3-4 outlines the desired future condition objective summary for allotment streams currently not meeting DFC due to grazing related impacts. Forage utilization rates for all other allotment streams follow existing Forest Plan standards. Table 3-5 outlines the DFC objective summary for allotment streams currently not meeting DFC due to grazing related impacts. Forage utilization rates for all other streams will follow existing Forest Plan standards.

Table 3-3 PFC Status, Rosgen Channel Type, Channel Stability Departure

Stream	Location	PFC status	Rosgen channel Type	Channel Stability departure	Existing Community Type	Desired Community Type	Existing Similarity to DFC	Resource Value
Bald Knob Allotment								
Browns Gulch	**5043690N 512484E**	PFC	A4	None Pristine	Albas[1]/ Calcan[2]	Albas/ Calcan	High	Class B
Tributary to Browns Gulch	**5043811N 512337E**	PFC	A5	None Pristine	Albas/ Calcan	Albas/ Calcan	High	Class B
West Pine Allotment								
West Pine Cr	**Reach upstream of FS boundary to old trailhead**	FAR (with upward trend)	B3/B4	M Due to post fire response, riparian logging, and bank trampling	Psemen[3]/ Corsto[4] Fire areas have brome habitat type	Psemen/ Corsto	Mod/High	Class A
North Fork West Pine Cr	**5040176N 518118E**	FAR (with upward trend	B4a inside a G4	L Post fire response, shrub browsing	Poptri[5]/ Corsto	Poptri/ Corsto	Mod/Hi	Class A
Eightmile Allotment								
Eightmile Cr	5032274 N 515649 E	PFC	C4b	None Pristine	Saldru[6]/ Carros[7]	Saldru/ Carros	High	Class B
Dry Cr	5035913 N 516600 E	PFC	B3a	L Riparian logging	Albas/ Calcan Psemen/ Phlpra[8]	Albas/ Calcan Psemen/ Corsto	Mod/Hi	Class B
Dry Cr	5037213 N 518992 E	FAR (with upward trend)	B4	L Riparian logging, shrub utilization	Poptre[10]/ Poapre[9]	Poptre/ Corsto	Mod/Hi	Class B
Rock Creek South Allotment								
Rock Cr	5007505 N 500268 E	PFC	B2a	None Pristine	Albas/ Calcan	Alblas/ Calcan	High	Class A

Stream	Location	PFC status	Rosgen channel Type	Channel Stability departure	Existing Community Type	Desired Community Type	Existing Similarity to DFC	Resource Value
Rock Cr	5007616 N 500795 E	PFC	B2a	None Pristine	Alblas/ Calcan	Alblas/ Calcan	High	Class A
Rock Cr	5007769 N 501276 E	PFC	A2	None Pristine	Alblas/ Calcan	Alblas/ Calcan	High	Class A
Stoughten Cr	5009421 N 502189 E	PFC	B4/B5	None Near Pristine	Alblas/ Calcan	Alblas/ Calcan	High	Class A
Fisher Cr	5008732 N 500604 E	PFC	B3a	L Minor trail crossing impacts	Psemen/ Corsto	Psemen/ Corsto	High	Class A
Donahue Cr	5012102 N 503795 E	PFC	B2a	None Near Pristine	Alblas/ Calcan	Alblas/ Calcan	High	Class A
Unnamed trib to Donahue Cr.	5010850 N 503474 E	PFC	B2a	None Pristine	Alblas/ Calcan	Alblas/ Calcan	High	Class A
Little Donahue Cr		PFC	B3a	None Near Pristine	Psemen/ Phlpra	Psemen/ Corsto	High	Class A

[1]Albas refers to (?), [2] Calcan refers to pine grass, [3] Psemen refers to Doug fir, [4] Corsto refers to Dogwood species, [5] Poptri refers to Black Cottonwood, [6] Saldru refers to Drummond willow, [7] Carros refers to beaked sedge, [8] Phlpra refers to common timothy, [9] Popre refers to bluegrass species, [10] Poptre refers to aspen

Table 3-4 Desired Future Condition Description Summary, and Critical Grazing Parameters (i.e. forage use and bank trampling)

Stream	DFC Status	Desired DFC description	Critical Parameter to Meet DFC
Bald Knob Allotment			
Browns Gulch	@DFC	No change from existing condition	NA
Tributary to Browns Gulch	@DFC	No change from existing condition	NA
West Pine Allotment			
West Pine Cr	Not @DFC	Slight changes from existing condition are recommended. Vegetation communities meet DFC, but there are limited areas where bank trampling is causing channel widening.	Streambank alteration
North Fork West Pine Cr	Not @DFC	DFC is for increased vigor and age class diversity of woody shrubs and aspen.	Woody utilization
Eightmile Allotment			
Eightmile Cr	@DFC	No change from existing condition	NA
Dry Cr (upper reach)	@DFC	No change from existing condition	NA
Dry Cr (lower reach)	Not @DFC	DFC is for increased shrubs. Bank trampling can occur when grazed	Woody utilization, streambank alteration
Rock Cr south Allotment			
Rock Cr	@DFC	No change from existing condition	NA
Rock Cr	@DFC	No change from existing condition	NA
Rock Cr	@DFC	No change from existing condition	NA
Stoughten Cr	@DFC	No change from existing condition	NA
Fisher Cr	@DFC	Minor bank trampling at one crossing, not enough to warrant change in management	NA
Donahue Cr	@DFC	No change from existing condition	NA
Unnamed trib to Donahue Cr.	@DFC	No change from existing condition	NA
Little Donahue Cr	@DFC	No change from existing condition	NA

Table 3-5 Desired Future Condition Objective Summary for Streams Currently Not Meeting DFC Due to Grazing Related Impacts

Stream	DFC Objective	Critical Parameters	Use levels to meet DFC						Allowable Streambank Alteration
			End season stubble height (in) by month		Allowable % woody utilization by month		Allowable % forage utilization by month		
			Early (J,J,A)	Late (S,O)	Early (J,J,A)	Late (S,O)	Early (J,J,A)	Late (S,O)	
West Pine Allotment									
West Pine Cr	Increase bank stability by reducing trampling	Streambank alteration	NA	NA	NA	NA	NA	NA	20%
North Fk West Pine Cr	Increase vigor and age class diversity of woody shrubs	Shrub utilization	NA	3 inches	15%	10%	50%	40%	NA
Eightmile Allotment									
Dry Cr (lower reach)	Increase vigor and age class diversity of woody shrubs	Shrub utilization	NA	3 inches	15%	10%	50%	40%	NA

Direct and Indirect Effects

*S*tream habitat and fish population measurements and observations; channel type and sensitivity analysis; existing versus anticipated bank and channel stability by alternative; and existing versus anticipated riparian use by alternative would be measured to assess potential to meet DFC as described in Table 3-5.

Alternative One - No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Alternative 1 would terminate the term grazing permits in each allotment and eliminate maintenance of structural improvements on National Forest land. Implementation of Alternative 1, the no grazing alternative, would eliminate all potential for direct or indirect grazing related affects to currently or potentially impacted reaches of streams within the analysis area on National Forest land. The permittees may continue to graze livestock on adjacent private land. Stream habitat attributes influenced by grazing would likely achieve near pristine reference conditions on the National Forest stream segments over time. The desired future condition of all stream segments throughout the allotments, as described above, would be achieved. All Forest Plan standards relative to grazing and riparian areas would be met. Currently, most streams within the analysis area meet their desired condition.

Implementation of Alternative 1 would have no effect for Bald Knob, Eightmile, and Rock Creek South Allotments because the current grazing management fully meet DFC's. There would be some minor beneficial effects for West Pine Allotment because minor DFC departures currently exist.

Alternative 2 - Current Management

Inherent stability for streams throughout the analysis area varies with stream type and existing riparian vegetation community types. Most of the stream reaches surveyed are dominated by overstory conifers with understory woody shrubs, grasses and forbs and have channel types that are inherently stable. Table 3-2 lists streams with channel types, riparian vegetation types, and their inherent stability or susceptibility to grazing impacts.

Bald Knob Allotment

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, field reviews, and PFC evaluations, the existing grazing management strategy within the Bald Knob Allotment has had no impact on riparian vegetation, streambank or channel stability, channel form and function, and overall aquatic habitat quality. Existing habitat conditions exceed 90% of the streams inherent habitat capability for attributes influenced by grazing. Browns Gulch and the unnamed tributary to Browns Gulch are currently meeting the desired future condition for habitat attributes potentially affected by grazing. As such, habitat conditions meet Forest Plan Implementation guidelines for habitat quality. Continued grazing under the current management strategy would result in "*no impact*" to water quality or stream channel stability.

West Pine Allotment

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy within the West Pine Allotment has had minor impact on riparian vegetation, streambank or channel stability, channel form and function and overall habitat quality for Yellowstone cutthroat trout in West Pine Creek. Grazing has had no to minimal impact on stream habitat attributes for the North Fork of West Pine Creek. Existing habitat conditions do not currently meet 90% of the streams' inherent habitat capability, but primarily for attributes not influenced by grazing. LWD frequencies are below optimal, and watershed instability still exists after the Fridley Fire. The North Fork West Pine Creek has a relatively low inherent stability and would be sensitive to grazing related impacts. However, no grazing related impacts were evident. For West Pine Creek proper, the channel is inherently more stable, but minor grazing related impacts were observed. Suitable forage along the stream as a whole is lacking, however, some bank trampling and forage over-utilization is occurring along short segments near the forest boundary. These areas receive increased use by cattle seeking shade and water. Grazing related impacts were primarily a result of some trailing and associated bank trampling, and low levels of browse and forage use. The desired future condition for West Pine Creek is to reduce the amount of bank disturbance. Continued grazing under the current management strategy would likely not result in the stream reaching its desired condition with minor impacts to fish habitat.

Eightmile Allotment

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy within the Eightmile Allotment has had minimal impact on riparian vegetation, streambank or channel stability, channel form and function for Eightmile Creek. Cattle access to the stream is limited to a short reach near the forest boundary, and no cattle related impacts were observed during surveys in 2007. Existing habitat conditions exceed 90% of the stream's inherent habitat capability. LWD frequencies are high in Eightmile Creek, and the channel continues to adjust to post-fire streamflow and sediment changes, and grazing has not influenced recovery. As such, habitat conditions meet Forest Plan Implementation guidelines for habitat quality. The stream is currently meeting the desired future condition. Continued grazing under the current management strategy would result in "*no effect*" on to the Yellowstone cutthroat trout population or habitat in Meadow Creek. The stream is currently meeting the desired future condition for habitat attributes potentially affected by grazing.

Rock Creek South Allotment.

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy for the Rock Creek South Allotment has had no impact on riparian vegetation, streambank or channel stability, channel form and function, and/or overall habitat quality for Yellowstone cutthroat trout in the Rock Creek and Donahue Creek drainages. Topography and limited suitable forage limits or precludes cattle use along the majority of those streams. Existing habitat conditions exceed 90% of the streams inherent habitat capability for attributes influenced by grazing. As such, habitat conditions meet Forest Plan Implementation guidelines. Continued grazing under the current management strategy would result in "*no impact*" to the Yellowstone cutthroat trout populations or habitat in those streams. The streams are currently meeting the desired future condition for habitat attributes potentially affected by grazing.

Alternative 3 - Adaptive Management

With implementation of Alternative 3, livestock grazing would be permitted under management systems designed to meet Forest Plan standards and guidelines focusing on end results. End results are described in terms of "Desired Future Conditions". A series of adaptive management practices are prescribed in phases in order to meet DFC's. The management changes with Alternative 3 would be expected to reduce grazing related impacts to meet Forest Plan standards and DFC's and result in *no effect* determinations. Proposed actions common to all allotments are described in Chapter 2-8. Riparian and streambank stability mitigation are outlined in Chapter 2-16.

Allotment specific management actions proposed to meet Forest Plan management direction and stream specific DFC's are described below.

Bald Knob Allotment

Overall the Bald Knob Allotment is currently meeting Forest Plan standards and DFC. No specific phased actions are being proposed at this time. All streams in this allotment are considered to be at DFC and are in properly functioning condition. If after three years, monitoring shows that any stream reach begins to deviate from DFC or properly functioning condition, then phases may be implemented. If Phase 1 proves unsuccessful in maintaining Gallatin Forest Plan utilization standards and long-term resource goals after five years of monitoring, then the allotment would be re-evaluated with the permittee to consider further actions necessary to achieve DFC, including a reduction in livestock numbers and/or a reduction in the season of use.

West Pine Allotment

Currently, West Pine Creek and the North Fork of West Pine Creek are considered to be functioning at risk with an upward trend. The primary reason for the functioning at risk determination was related to post fire response to elevated streamflows and sediment, and because of low frequencies of LWD. The functioning at risk determination was only partially related to grazing impacts along two short reaches near the forest boundary. A short segment of West Pine Creek has some bank trampling that should be reduced. A short reach of the North Fork of West Pine Creek would benefit from a higher density of shrubs and aspen regeneration. If after three years of monitoring these conditions are still of concern, then Phase 2 actions would be implemented.

Specific actions are being proposed in Phases 1 and 2 for the West Pine Allotment in Alternative 3 to address concerns in West Pine Creek and the North Fork of West Pine Creek and to ensure the streams progress towards the DFC's. These actions include exploring ***o***pportunities and locations for new

water developments and repairing or improving existing structures, as well as installation of new water developments for better distribution of cattle. Excluding a small pond in Chimney Rock pasture from grazing by installing jack and rail fence is also being considered.

Monitoring would be conducted throughout both phases to determine if grazing management of upland and riparian vegetation meet LRMP goals and objectives and DFC's. No other phases would be established, unless monitoring results define the need for additional actions.

Eightmile Allotment

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy within the allotment has had minimal impact on riparian vegetation, streambank or channel stability, channel form and function for Eightmile Creek. Cattle access to the stream is limited to a short reach near the forest boundary, and no cattle related impacts were observed during surveys in 2007. Existing habitat conditions exceed 90% of the stream's inherent habitat capability. LWD frequencies are high in Eightmile Creek, and the channel continues to adjust to post fire streamflow and sediment changes, and grazing has not influenced recovery. As such, habitat conditions meet Forest Plan Implementation guidelines for habitat quality and the stream is currently meeting the desired future condition. Should cattle related impacts occur, the adaptive management strategy under this alternative would allow for alternative strategies designed to mitigate affects. The stream is currently meeting the desired future condition for habitat attributes potentially affected by grazing.

Likewise, the headwater reach of Dry Creek is currently meeting its desired condition. Because of the less stable nature of the ephemeral tributary lower in the drainage, some management change is necessary to meet the desired condition of that reach.

The starting point for this allotment would be to utilize a deferred rotation grazing system in the Eightmile Unit. This would continue until the vegetation treatments have been completed within the Dry Creek Unit. Upon completion, this allotment would utilize both units in the three pasture deferred rotation grazing system. Native shrub/tree planting along sensitive riparian areas along reaches of Dry Creek is proposed, as well as exploration of opportunities and locations for new water developments and/or repair or improvement of existing structures.

If after three years, monitoring shows the above practices were not sufficient to maintain DFC and continue meeting Forest Plan Standards then additional phases would be implemented. Monitoring would be conducted through all

phases to determine if grazing management of upland and riparian vegetation meet LRMP goals and objectives and DFC's. No other phases would be established, unless monitoring results define the need for additional actions.

Assuming the management changes outlined above would result in lower reaches of Dry Creek moving toward the DFC, this alternative would have a *beneficial effect*.

Rock Creek South Allotment

Based on habitat surveys, bank stability data, stream channel sensitivity analysis, and field reviews, the existing grazing management strategy for the Rock Creek south Allotment has had no impact on riparian vegetation, streambank or channel stability, channel form and function and overall habitat quality for Yellowstone cutthroat trout in the Rock Creek and Donahue Creek drainages. Topography and limited suitable forage limits or precludes cattle use along the majority of those streams. Existing habitat conditions exceed 90% of the streams inherent habitat capability for attributes influenced by grazing. As such, habitat conditions meet Forest Plan Implementation guidelines. Continued grazing under the current management strategy would result in "*no impact*" to the Yellowstone cutthroat trout populations or habitat in those streams. The streams are currently meeting the desired future condition for habitat attributes potentially affected by grazing. For this alternative, the allotment would remain vacant, and would be recommended for closure. As such, there would be no potential for future cattle related impact to occur.

Cumulative Effects

Past, present and reasonably foreseeable actions considered in the cumulative effects analysis for riparian vegetation include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands

All Alternatives

West Pine & Eightmile Allotments

Recent large wildfires (Fridley 2001) have changed the timing and magnitude of spring snowmelt runoff and discharge characteristics associated with intense summer rainfall events. The increase in water and sediment discharge has altered channel morphologies in West Pine Creek, the North Fork of West Pine Creek, and Eightmile Creek. Large woody debris (LWD) was added in reaches of West Pine Creek where LWD frequencies were low because of

historic riparian timber harvest. Adding LWD improved fish habitat complexity and restored energy dissipation features. The project had a beneficial affect on fish habitat and channel stability. For the short reach in West Pine Creek where minor cattle impacts were observed, a cumulative stability benefit will be realized.

For the West Pine Allotment watershed, most roads used for previous timber harvest have been closed, obliterated, or reconturred and sediment increases have likely subsided. Cattle grazing is not increasing sediment delivery to streams in the West Pine or Eightmile Allotments. There were no past harvest activities in the Eightmile Allotment.

There are not likely to be any cumulative effects to either fisheries or water quality associated with implementation of any of the alternatives in combination with any of the above activities for the West Pine or Eightmile Allotments.

Bald Knob & Rock Creek South Allotments

For the Rock Creek watersheds, most roads used for previous timber harvest have been closed, obliterated, or recontoured and sediment increases have likely subsided. In 1999, there was 2 miles of road decommissioning in the South Rock Creek Allotment to convert the use from a road to an ATV trail. This road decommissioning has likely reduced sediment yield to receiving streams. Decommissioning efforts have also restored watershed hydrologic processes on a site specific basis. Hence, the decommissioning work has resulted in a beneficial effect to watershed hydrologic processes. Livestock grazing is not increasing sediment to analysis area streams so cumulative affects are not likely.

Cattle grazing is not increasing sediment delivery to streams in the Bald Knob Allotment. Browns Gulch in the Bald Knob Allotment is not being affected by increased sediment yield. The stream appears to be in pristine condition.

There would not likely be any cumulative effects to fisheries or water quality associated with implementation of any of the alternatives in combination with any the above activities. Streams in the Bald Knob and Rock Creek Allotments are currently at PFC. Nothing being proposed in either of these allotments with any of the alternatives is likely to modify stream conditions enough to create cumulative effects

B. Riparian Vegetation

Resource Issue B pertains to the effects that alternatives associated with this proposal would have on riparian vegetation within the West Paradise Allotments. Streamside habitats, wet meadows, seeps, and springs all attract migratory bird

species, a variety of wildlife and livestock. Riparian areas are used as foraging sites, nesting habitat, and cover. Optimal riparian dominated vegetation consists of native grass-like plants, grasses, forbs, and shrubs.

Desired future conditions (DFC) for riparian vegetation are for plant communities associated with springs and riparian areas to exhibit dominance of desired native sedges, grasses and forbs. Desirable woody species should be vigorous and reproducing successfully as demonstrated by an unaltered growth form and representation of all age classes. Introduced and native species usually associated with long term, intense grazing may be present but at relatively low levels.

Scale of Analysis

Temporal Bounds: The temporal bounds for past, present and future actions to be considered in evaluating effects to riparian vegetation reflect the life of the livestock permit or approximately 10 years.

Spatial Bounds: The spatial bounds considered for effects analysis for riparian vegetation include the riparian areas within the boundaries of the Bald Knob, West Pine, Eightmile, and Rock Creek South Allotments.

Affected Environment

The majority of the area containing riparian dominated vegetation is in good condition on all of the West Paradise Allotments and is meeting the desired future condition (DFC). There are a few isolated exceptions, where the stream reach is at proper functioning condition (PFC) or functioning at risk (FAR), but is not meeting the DFC for vigor or age class diversity for the shrub community. The remaining riparian areas are inaccessible to livestock and are either meeting the DFC or are not at DFC for reasons other than livestock use.

Riparian habitats on the West Paradise Allotments are either only lightly impacted by cattle or are not at all impacted. These areas exhibit a high similarity to the potential natural community. They are either inaccessible to livestock, produce forage that is not suitable for livestock, are grazed at appropriate livestock stocking levels, receive adequate grazing recovery periods or are grazed only in passing and not used for extensive periods for loafing and shade.

There are some small areas in West Pine Creek and North Fork of West Pine Creek where livestock concentration has caused trampling and browsing, retarding the development of healthy shrub communities. Unprotected seeps and spring sources associated with constructed water developments are being impacted by livestock in this way. North Dry Creek has also been impacted by riparian logging and is now susceptible to overgrazing by livestock due to its accessibility and productivity.

Direct/Indirect Effects

Alternative 1 –No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

The removal of grazing from the West Paradise Allotments would result in the maintenance of those riparian reaches that are currently at their DFC and/or improvement of those isolated reaches that show a departure from DFC, including the sources to water developments. Once livestock is excluded, the springs will likely fully recover.

Optimal vegetation consisting of native grass-like plants, grasses, forbs, and shrubs would dominate the riparian areas and increase in vigor. Riparian vegetation that is currently impacted in small patches around water developments where livestock have access would improve. Bare ground would decrease shrub vigor and structural diversity would increase, and vegetation composition would better reflect the native riparian plant communities.

Alternative 2 – Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Continued implementation of current management actions (Alternative 2) may have some adverse effects to stream reaches that are currently not meeting DFC. These stream reaches have been adversely affected by past activities such as logging and recent wildfires. All other riparian areas are in good condition.

The current grazing practices on the Bald Knob, West Pine, Eightmile, and Rock Creek South Allotments have shown minor adverse impacts to riparian areas in isolated reaches. With the continued implementation of current management, those riparian reaches that are currently at their DFC would most likely be maintained. Optimal riparian dominated vegetation consisting of native grass-like plants, grasses, forbs, and shrubs would persist where it currently exists. Impacts to riparian vegetation in small patches around water developments where livestock have access would continue. Impacts at these sites include introduction of non-native species, bare ground, reduced vigor of shrubs, decreased structural diversity, and altered vegetation composition.

There would continue to be some isolated areas identified as dissimilar from their DFC, more than with implementation of the No Grazing Alternative (Alternative 1) or the Adaptive Management Alternative (Alternative 3). Livestock grazing has affected riparian vegetation in localized areas throughout the allotments, but it is unlikely that these effects have limited the extent and magnitude of riparian vegetation to a large degree across the landscape.

Alternative 3 – Adaptive Management

Bald Knob,West Pine, & Eightmile Allotments

With implementation of Alternative 3, adaptive management activities would be implemented over time, as needed. The actions being proposed, such as improving livestock distribution, constructing additional water sources, implementation of riparian utilization guidelines, and adaptive management strategies, would maintain or improve riparian conditions, thus maintaining or improving vegetative diversity of age and structure.

The above actions would have a beneficial effect on riparian vegetation. Those riparian reaches with plant communities that receive light livestock use would maintain or improve their potential natural community, except where other activities have compromised riparian habitat (i.e. riparian harvest, road building). The plant communities would have fully developed structural layers made up of desired plant species. Canopy cover of desired native sedges, grasses and forbs would reflect potential. Introduced species may persist but at relatively low levels. As browsing and trampling is decreased, willows and other desired woody species would become vigorous, as demonstrated by their robust establishment and successful reproduction. A full complement of desired plant species adapted to some level of grazing would occur long-term. Long term, dense shrub communities and subsequent extensive wet soils would discourage livestock impact.

Rock Creek South Allotment

The Rock Creek South Allotment would be recommended for closure with implementation of Alternative 3. This would not result in a substantial change in riparian vegetation on that allotment, as it is currently meeting DFC. Native shrubs and/or trees would be planted along sensitive riparian areas in Dry Creek, moving the shrub community to the desired condition faster than would occur with livestock management alone.

Cumulative Effects

All Alternatives

Bald Knob,West Pine, Eightmile, & Rock Creek South Allotments

Past, present and reasonably foreseeable actions considered in the cumulative effects analysis for riparian vegetation include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments,

future prescribed burning, and other foreseeable activities on national forest lands.

There would be no cumulative effects to riparian vegetation associated with implementation of any of the alternatives in combination with the above activities

C. Upland Vegetation

Resource Issue C pertains to the effects that alternatives associated with this proposal would have on upland vegetation within the West Paradise Allotments. The majority of the areas containing upland vegetation are currently in good condition on all of the allotments.

Scale of Analysis

Temporal Bounds: The temporal bounds for past, present and future actions to be considered in evaluating effects to riparian vegetation reflect the life of the livestock permit or approximately 10 years into the past and future. The rationale for this time frame is that the effects of most actions within the past 10 years in this area are well known.

Spatial Bounds: The spatial bounds considered for the effects analysis for upland vegetation includes Bald Knob, West Pine, Eightmile and Rock Creek South Allotments. The rationale for setting these boundaries is that the distribution of cattle in and between allotments will not be affected outside of this area.

Affected Environment

Throughout the analysis area, there are a wide variety of vegetative communities. These allotments consist of approximately 18,978 acres. Of these acres, approximately 3,592 acres are considered suitable for grazing. The suitable livestock grazing areas are located in open meadows and under coniferous forest in fairly scattered locations across the allotments, along roadways and in openings created by timber harvest. According to field visits and vegetation mapping, the upland vegetation is in fair to good condition. Different condition levels are determined from measuring species composition, forage production, percent litter retention and percent bare ground and if they are at desired levels.

Suitable vegetation types within the allotments include open grasslands, sagebrush/grasslands and timbered grasslands. Within the grassland vegetation types, timothy is a dominant nonnative species in areas of deeper soil through out the allotments. This species is now considered a part of the native community but is not a preferred species. Because timothy becomes less palatable to livestock as it matures, early season grazing prior to seed set may be a tactic for reducing the occurrence of this species.

The Fridley fire of 2001 has changed portions of the vegetative components of West Pine and Eightmile Allotments.

Bald Knob Allotment

The analysis for the Bald Knob Allotment, will only consider the vegetation types and utilization levels for National Forest lands (approximately 438 acres) within the allotment. The remainder of this allotment consists of private lands that the Forest Service has no control over (approximately 2,220 acres). Of the total National Forest lands within the allotment, approximately 34 acres (8%) are considered suitable for livestock grazing and approximately 404 acres (92%) are either too steep, rocky, forested, or otherwise unsuitable for livestock use. Dominant vegetation species include Douglas-fir, subalpine fir, snowberry, timothy, Idaho fescue, bluebunch wheatgrass, and Kentucky bluegrass. Suitable vegetation types in this allotment are displayed in Table 3-6.

Table 3-6 –Habitat and Suitability by Acres for Bald Knob Allotment

Type	Acres	% Suitable	Habitat Type
Grasslands	10	29	Timothy/Idaho fescue, Idaho fescue/bluebunch wheatgrass, Kentucky bluegrass/timothy
Forest/Grass/ Shrub	24	71	Douglas-fir/snowberry, subalpine fir/grouse whortleberry, Douglas-fir/timothy

The dominant rangeland habitat type on National Forest lands within this allotment is subalpine fir/grouse whortleberry. The majority of the private lands within the allotment boundary have been recently logged, causing the upland vegetative types to be converted from Douglas-fir/pine grass to transitory range that is dominated by timothy.

According to past monitoring data, upland range utilization levels in August of 2006 were at 7 percent. The majority of the suitable range within this allotment is located on private land. As shown in Table 3-6 above, there are only approximately 34 acres of National Forest lands that are available for cattle to graze. Because most of the suitable range is on private land, utilization on National Forest lands is limited, retaining upland vegetation in good condition.

Currently, there are no improvements associated with this allotment. There are several boundary adjacent fences, which are maintained by the private landowners.

West Pine Allotment

The West Pine Allotment consists of approximately 1,993 acres (approximately 1,510 National Forest and 483 Private). Of these total acres, approximately 743 acres (37%) acres are considered suitable for livestock grazing and approximately 1,250 acres (63%) are either too steep, rocky, forested or otherwise unsuitable for livestock use. Of the suitable vegetation, approximately 563 acres are on National Forest land and approximately 180 acres are privately owned. Dominate vegetation species includes Douglas-fir, lodgepole pine, big sagebrush, snowberry, timothy, Idaho Fescue, Kentucky bluegrass and mountain brome.

In 2001, the Fridley Fire burned through much of this allotment, creating transitory rangelands. Over a period of 10-20 years, some of these transitory suitable acres will become unsuitable due to conifer regeneration. To prevent erosion and weed spread after the fire, some of the burned areas were reseeded with slender wheatgrass, which is still prevalent today. Suitable vegetation types in this allotment are displayed in Table 3-7.

Table 3-7 – Habitat and Suitability by Acres for West Pine Allotment

Type	Acres	% Suitable	Habitat Type
Grasslands	223	30	Idaho fescue/slender wheatgrass, Kentucky bluegrass/timothy, timothy/mountain brome/Kentucky bluegrass
Grass/Shrub	186	25	Big sage/Idaho fescue
Forest/Grass/ Shrub	334	45	Douglas-fir/snowberry/pine grass, Douglas-fir/timothy

The dominant rangeland habitat on this allotment is mountain big sagebrush/Idaho fescue. The majority of the meadows consist of timothy. The burned areas that are now transitory range are dominated by pine grass and slender wheatgrass.

According to past monitoring data, utilization within the allotment over the last two years was approximately 15 percent (percent weight use). The upland vegetation is still recovering from the Fridley Fire, but overall is in good condition.

Currently, there are 4 improvements associated with this allotment, two water developments and two fences. There are several boundary fences, maintained by the private landowners that are adjacent to the allotment.

Eightmile Allotment

The Eightmile Allotment consists of approximately 6,181 acres. Of these total acres, approximately 1,067 acres (17%) are considered suitable for livestock grazing and approximately 5,115 acres (83%) are either too steep, rocky, forested or otherwise unsuitable for livestock use. Of the suitable vegetation, approximately 877 acres are on National Forest land and approximately 190 acres are privately owned. Dominate vegetative species include Douglas-fir, lodgepole pine, Idaho Fescue, bluebunch wheatgrass, timothy, Kentucky bluegrass, basin wild rye, mountain brome, snowberry, wild rose, and mountain big sagebrush. Suitable vegetation types in this allotment are displayed in Table 3-8.

Table 3-8 – Habitat and Suitability by Acres for Eightmile Allotment

Type	Acres	% Suitable	Habitat Type
Grasslands	640	60	Bluebunch wheatgrass/Idaho fescue, Kentucky bluegrass/timothy/mountain brome, basin wild rye
Shrub/grass	107	10	Mountain big sagebrush/timothy/Idaho fescue, snowberry/wild rose/pinegrass
Forest/Grass/ Shrub	320	30	Douglas-fir/Idaho fescue, Douglas-fir/timothy/pinegrass, Douglas-fir/Kentucky bluegrass

According to the past monitoring records, utilization within the allotment from 2002-2003 was approximately 17 percent (percent weight used). From 2004-2006, there has been no grazing on the allotment due to the lack of water. In 2007, the cattle were turned on to the allotment by June 1st to utilize the water that was available. The utilization levels were approximately 20 percent (ocular estimate). Most of the utilization transects were taken in primary rangelands. Overall, the upland vegetation is in good condition.

In 2001, the Fridley Fire burned portions of this allotment; however, most of the burned areas lie within unsuitable range, therefore having very little effect on livestock grazing.

Currently, there are six improvements associated with this allotment; four water developments and two drift fences. Of the four water developments, two of them have dried up. There are several boundary fences maintained by

the private landowners that are adjacent to the allotment.

Rock Creek South Allotment

The Rock Creek South Allotment consists of approximately 8,146 acres (approximately 4,567 NF and 3,579 Private). Of these total acres, approximately 1,748 acres (21%) are considered suitable for livestock grazing and approximately 6,398 acres (79%) are either too steep, rocky, forested or otherwise unsuitable for livestock use. Of the suitable vegetation, approximately 769 acres are National Forest land and approximately 979 acres are private land. Dominant vegetative species include Douglas-fir, lodgepole pine, Idaho Fescue, bluebunch wheatgrass, timothy, Kentucky bluegrass, snowberry, wild rose, and mountain big sagebrush. Suitable vegetation types in this allotment are displayed in Table 3-9 below.

Table 3-9 – Habitat and Suitability by Acres for Rock Creek Allotment

Type	Acres	% Suitable	Habitat Type
Grasslands	297	17	Timothy/Idaho fescue, Idaho fescue/bluebunch wheatgrass, Kentucky bluegrass/timothy
Shrub/grass	787	45	Mountain big sagebrush/Idaho fescue
Forest/Grass/ Shrub	664	38	Douglas-fir/snowberry, lodgepole pine/pine grass, Douglas-fir/timothy

This allotment has not been grazed for approximately 14 years. Utilization levels prior to the permit for this allotment being waived back to the Forest Service were between 25-27 percent (percent weight use) in the early 80's.

Currently, there are eight improvements associated with this allotment, three water developments and five fences. There are several boundary fences maintained by the private landowners that are adjacent to the allotment.

Direct/Indirect Effects

Alternative 1 –No Grazing

Bald Knob,West Pine, Eightmile, & Rock Creek South Allotments

With implementation of Alternative 1, no permitted livestock grazing would occur on any of the four allotments within the analysis area. Current permittees would be given two years written advance notice of the cancellation of their permits as provided for under 36 CFR 222.4(a)(1). Existing fences, with the exception of the privately owned National Forest

boundary fence, would be removed at the expense of the Forest Service.

Alternative 1 would provide for an overall increase in vegetative biomass. This recovery would likely be dramatic initially, as would the increase in plant density. Within the allotments as a whole and over a long period of time, plant communities may have a more favorable composition of native species. This would be a result of plant species that increase in density from repeated grazing no longer receiving annual stimulus. Vigor and individual plant production may increase in the short term (up to 10 years), but would diminish somewhat in the long run as forage plant communities become decadent and die back due to lack of grazing. Ground cover would increase with the accumulation of additional litter resulting in a decrease in plant community diversity, and in the equality of range conditions including forage plant production.

Eliminating livestock grazing impacts on non-native grasslands would allow for some improvement; however timothy and Kentucky bluegrass are too competitive to allow these areas to shift back to native plant communities.

The No Grazing Alternative may partially resolve any issues related to livestock grazing. However, it would not eliminate effects of livestock grazing on private land. If this alternative were selected, the permittees would likely fence the National Forest boundary and continue to graze. This could result in additional impacts to streams and riparian areas located on private lands.

Alternative 2- Current Management

Bald Knob, West Pine, & Eightmile Allotments

Livestock grazing would continue to be permitted under current management, which includes all applicable standards and guidelines from the current Land and Resource Management Plan (LRMP) and the Forest Plan. There would be no changes to current seasons of use, grazing rotation systems, livestock numbers, kind or class. No new range improvements would be constructed to implement better management. Changes to grazing management would be administrative only. Proactive management of the range resources, to adapt to changing resource or environmental conditions would not occur.

This alternative would provide for some improvement in vegetative biomass. As stated above, livestock grazing would continue under current management, not allowing for implementation of new tools (i.e. water tanks) to help with distribution of livestock. Impacts to vegetation from cattle would be within Forest Plan Standards and guidelines.

Rock Creek South Allotment

The Rock Creek South Allotment would remain vacant, unless necessary improvements (fencing) are completed by the perspective permittee. Perspective permits would adhere to the same terms and conditions that applied to the previous permits, which was waived back to the Forest Service.

This allotment has seen an increase in plant vigor over the past years of no grazing. However, the vigor is starting to diminish because the forage plant communities are becoming decedent and dying back due to lack of grazing. Ground cover is increasing with the accumulation of additional litter resulting in a decrease in plant community diversity and in the quality of range conditions including forage plant production.

Monitoring would occur over time for all allotments within the analysis area. Results from the monitoring would be used by the ID Team and District Ranger to determine the effectiveness of the allotment management plan (AMP) objectives. Failure to meet or exceed management objectives could result in an amendment or revision of the AMP.

Alternative 3 – Adaptive Management

Alternative 3 would implement adaptive management. Adaptive management is the process of utilizing monitoring data to determine if management changes are needed to improve resource conditions within allotments, and if so, what changes, and to what degree. This alternative would focus on end results for the resource, as opposed to specific seasons of use, permitted livestock numbers, and grazing rotations. In the context of this document, this means that a course of action is selected as a starting point that is believed to best meet or move toward the desired objectives. Monitoring would occur over time with evaluations of the results being used by the range specialist and the Line Officer to make adjustments to management as needed to ensure adequate progress toward the defined objectives.

The desired future condition (DFC) of an area describes the conditions that management is intended to produce. The DFC reflects the capability of the landscape, the various laws and regulations that apply to an area, and the values, or "products" that are desired. The DFC is portrayed through descriptions of how an area could look and function. DFCs for the West paradise Allotments were derived from utilizing a combination of Land and Resource Management Practices (LRMP) goals and objectives, standards derived from the Forest Plan regarding riparian vegetation utilization. Generalized DFCs for upland vegetation are to maintain good to excellent upland vegetation conditions through improved livestock distribution, proper utilization levels, and management of grass and forbs in order to decrease invasive weed species including spotted knapweed, bull

thistle, musk thistle, Canada thistle, and houndstongue.

Alternative 3 sets upland utilization for all allotments within the analysis area, according to the Range Forest Service Handbook (R1-FSH 2209.21, pg.633-1). The utilization standards are described in Table 3-10 below:

Table 3-10 Upland Utilization for All Allotments

Pasture Type	Dry Range	Moist Range
Early Pasture	55%	65%
Late Pasture	35%	45%

The above utilization standards would be used as a monitoring tool that would be measured periodically to determine management effectiveness. The starting point under this alternative for all allotments would be to continue with the existing permits including the season of use, livestock numbers, kind, and class. This alternative also allows for the flexibility to install range improvement as monitoring shows appropriate. Off-site water developments, riparian pastures, drift fences, and debris placement are some possibilities of different types of range improvements that could be installed.

Bald Knob, West Pine, and Eightmile Allotments

Under this alternative, plant vigor, plant community compositions, mineral and nutrient cycling of upland vegetation would improve. The majority of forage plants would receive some use by livestock; therefore new growth would be initiated each year reducing buildup of dead vegetation. Areas with non-native grasslands would still remain; timothy and Kentucky bluegrass are too competitive to allow these areas to shift back to native plant communities.

This alternative will also improve current livestock distribution with construction of new water developments. They may also help reduce high use on some riparian areas.

Rock Creek Allotment

Under Alternative 3, the Forest Service is recommending closure on Rock Creek South Allotment. The adjacent landowner to the west of the allotment owns the majority of the private land within the allotment boundary (approximately 2,939 acres) and does not run a livestock operation. The direct and indirect effects are the same as Alternative 1.

Cumulative Effects

Past, present and reasonably foreseeable actions include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands.

Alternative 1 –No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

A large wildfire could cumulatively impact upland vegetation on the allotments. Without grazing on the National Forest lands, the threat for wildfire to be ignited and/or carried in suitable range types (grassy areas) could increase from the current state. There would likely be no other cumulative effects from implementation of Alternative 1.

Alternative 2 –Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Certain activities on adjacent private lands could introduce weeds, which could spread to the allotments and displace native upland vegetation. This could result in altered grazing patterns for livestock and possibly over-utilization of some areas with the allotments.

Future prescribed burning in the allotments would be beneficial to upland vegetative types. However, following burning, the vegetation should be rested for one to two seasons to allow for healthy root systems and a chance for native vegetation to re-seed. Resting the allotment for a couple of grazing seasons could produce a cumulative impact for the permittees.

West Pine & Eightmile Allotments

Recent wildfires have changed some vegetative types and removed some natural barriers in portions of the West Pine and Eightmile Allotments, which could result in altered grazing patterns for livestock. Adequate monitoring, as outlined in Chapter 2-19 through 2-23, should identify problematic areas and help prevent over-utilization of these areas.

Bald Knob Allotment

The Bear Canyon Trail Creek LEX could have cumulative effects on the Bald Knob Allotment, *if* it is completed. If the LEX goes through in its entirety, the "On" portion of the allotment would become private land; causing the permit to be terminated. The permittee would then have two years to continue grazing or they could waive grazing rights upon completion of the LEX.

Alternative 3-Adaptive Management

Bald Knob, West Pine, & Eightmile Allotments

By utilizing adaptive management, implementation of Alternative 3 would eliminate most cumulative effects regarding upland vegetation. Any cumulative effects associated with potential future prescribed burning would be similar to those associated with Alternative 2.

Rock Creek South Allotment

Rock Creek South Allotment would be recommended for closure. Cumulative effects for Rock Creek South Allotment would be expected to be similar to those identified with Alternative 1.

D. Noxious Weeds

Resource Issue D pertains to the effects that the alternatives associated with this proposal would have on noxious weeds within the analysis area. There are currently approximately 129 acres of known infestations within the allotments.

Scale of Analysis

Temporal Bounds: The temporal bounds for past, present and future actions to be considered in evaluating the cumulative effects of noxious weeds is 10 years past and 5 years into the future. The rationale for this time frame is that activities within the last 10 years are the ones that have most likely contributed to weed infestations that we see today. While we can predict where weeds are likely to occur in the future based on current infestations, it is difficult to predict what activities will occur in the Smith Creek area in the future beyond about 5 years that will result in new infestations.

Spatial Bounds: The spatial bounds for cumulative effects analysis of noxious weeds includes Trail Creek, West Pine, Eightmile and Rock Creek watersheds to the ridges adjacent to the tributaries. The rationale for setting these boundaries is that the ridges often present physical barriers for plant movement and sometimes to activities (such as road building) that spread weeds. Some roads cross the ridges and out of the Smith Creek drainage, but most weeds within this area are

found along the roads that are lower in the drainages, along the streams

Affected Environment

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Throughout this analysis area, there are a wide variety of vegetative communities. The allotments consist of approximately 18,978 acres. Of these acres, approximately 129 acres contain invasive weeds (See Table 3-11 & Maps 3-6 through 3-8). The invasive weed species within the allotments present problems in terms of forage production and control measures. The weed infestations within the analysis area are generally associated with road systems. Activities on private lands that border National Forest lands may introduce noxious weeds that can spread to adjacent lands and/or nearby grazing allotments and then spread further by cattle grazing, wind, recreationalists and/or wildlife. Private landowners are required to control weeds on their lands, but this requirement is rarely enforced.

Canada thistle, musk thistle, bull thistle, houndstongue, and spotted knapweed are the major invasive species found on the allotments; although a variety of other species are present in isolated areas. There is an active weed control program on the allotments, which primarily targets roadside applications of herbicides. All treatments are in accordance with the June 2005 Gallatin National Forest Noxious and Invasive Weed Treatment Project EIS and Record of Decision.

Recent wildfires in the area have decreased the amount of tree canopy and native vegetative cover, allowing for noxious weeds to take hold in some portions of the West Pine and Eightmile Allotments. Over a period of 10-20 years, some of the canopy will come back, shading out some of the weeds.

Table 3-11 – Noxious Weed Infestations by Acres for All Allotments

Allotment	Acres	Noxious Weed Species
Bald Knob*	0	
West Pine	43	Canada thistle, musk thistle, bull thistle, spotted knapweed, hounds tongue, black henbane and mullein.
Eightmile	68	Canada thistle, musk thistle, pennycress, hounds tongue and mullein.
Rock Creek	18.5	Canada thistle, musk thistle, spotted knapweed, hounds tongue and a small patch of leafy spurge.

*This analysis only analyzes the Forest Service portion of this allotment

Direct/Indirect Effects

Alternative 1 – No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

With Alternative 1, no permitted livestock grazing would occur on any of the four allotments within the analysis area. Permittees would be given two years written advance notice of the cancellation of their permits as provided for under 36 CFR 222.4(a)(1). Existing fences, with the exception of privately owned National Forest boundary fence, would be removed at the expense of the Forest Service.
Alternative 1 would provide for an overall increase in vegetation biomass, therefore decreasing the amount of invasive weeds.

Within the allotments as a whole and over a long period of time, plant communities may contain a more favorable composition of native species; however, noxious weeds would continue to be present in various areas. Soil disturbance from cattle grazing would not be present; therefore susceptibility to invasion by certain weed species may be less. Reduction of noxious weeds through treatment, on National Forest lands, would continue as sites are identified and as funding allows.

The No Grazing Alternative may partially resolve any issues related to livestock grazing. However, it would not eliminate effects from livestock grazing on private lands. If Alternative 1 were, selected, the permittee would likely fence the National Forest boundary and continue to graze livestock. This could result in additional infestations of noxious weeds on private lands. Livestock grazing on private lands may introduce weeds that could spread to adjacent National Forest lands and/or other nearby private lands by wind, recreationists and/or wildlife. Private landowners are required to control weeds on their lands, but this requirement is rarely enforced.

Alternative 2–Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Livestock grazing would continue to be permitted under current management, which includes all applicable standards and guidelines from the current Land and Resource Management Plan (LRMP) and the Forest Plan. There would be no changes to the current season of use, grazing rotation systems, livestock numbers, kind or class. No new range improvements would be constructed to implement better management. Changes to grazing management would be administrative only. Proactive management of the range resources, to adapt to changing resource or environmental conditions would not occur.

Noxious weeds would continue to be present in various areas and would increase in areas of disturbance, such as along trails and salting areas. Noxious weeds could be spread by wind, recreationists and wildlife. They may even increase in areas where plants are repeatedly grazed during the growing season. Eventually many grazed plant species would die, leaving places within the vegetative community for less desirable plants to become established. Reduction of noxious weeds through treatment, on National Forest lands, would continue as sites are identified and as funding allows.

Alternative 3–Adaptive Management

Bald Knob, West Pine, Eightmile Allotments

Alternative 3 would implement adaptive management. Adaptive management is the process of utilizing monitoring data to determine if management changes are needed to improve resource conditions within allotments, and if so, what changes, and to what degree. This alternative would focus on end results for the resource, as opposed to specific season of use, permitted livestock numbers, grazing rotations. In the context of this document, this means that a course of action is selected as a starting point that is believed to best meet or move toward the desired objectives.

DFC is portrayed through descriptions of how an area could look and function. DFCs for the West Paradise Allotments were derived from utilizing a combination of Land and Resource Management Practices (LRMP) goals and objectives and standards derived from the Forest Plan regarding riparian vegetation utilization. Generalized DFC for vegetation is to maintain good to excellent vegetative conditions through improved livestock distribution, proper utilization levels, and management of grass and forbs to decrease invasive weed species, including spotted knapweed, bull thistle, musk thistle, Canada thistle, and houndstongue. However, noxious weeds would continue to be present in various areas and would spread by wind, recreationalists and wildlife. Reduction of noxious weeds through treatment, on National Forest lands, would continue as sites are identified and as funding allows.

Rock Creek South Allotment

Under Alternative 3, the Forest Service is recommending closure on the Rock Creek South Allotment. The direct/indirect effects regarding noxious weeds in relation to the Rock Creek South Allotment would be similar those associated with Alternative 1.

Cumulative Effects

Alternative 1 – No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Future wildfire could cumulatively impact noxious weeds within any of the allotments. Without grazing, on the National Forest lands, the threat for wildfire to be ignited and/or carried in suitable range types (grassy areas) could increase over time from the current state. Fine fuels could build up over a year or two, but then natural processes of decomposition set in, lowering the increased ignition probability. Fires expose ground surfaces, reduce shade and increase light, and create a flush of nutrients. All of these conditions favor weeds. The post-fire invasion and aggressive reestablishment of noxious weeds within the fire area would compete aggressively with desired native species for space and nutrients. Eventually the noxious weeds could change the composition and structure of the future environment. Any future prescribed burning treatments could also have cumulative impacts on noxious weed populations; however, mitigations (such as pre and post-treatments and monitoring) would be included in the prescriptions to help reduce the potential spread of noxious weeds. There would be no other cumulative effects associated with Alternative 1 because grazing would be eliminated after a two year phase out period.

Alternative 2–Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Activities that could present cumulative effects with implementation of Alternative 2 include recent and future wildfires, future prescribed burning, ground disturbing activities, past timber harvest, recreational activities, and activities on private lands in the area.

Wildfires expose ground surfaces, reduce shade and increase light, and create a flush of nutrients. All of these conditions favor weeds. The post-fire invasion and aggressive reestablishment of noxious weeds within the fire area competes aggressively with desired native species for space and nutrients. Eventually noxious weeds can change the composition and structure of the environment. Future proposed fuel treatments could also have cumulative impacts to noxious weeds; however, would be beneficial to the vegetation types and wildlife within the allotments. Mitigations (such as pre and post-treatments and monitoring) would be included in any prescriptions to help reduce the potential spread of noxious weeds.

Ground disturbing activities such as road decommissioning and rehabilitation (West Pine, Rock Creek and Eightmile Allotments) and the implementation of the Gallatin National Forest Travel Plan of December 2006 may also introduce noxious weeds. Roads and trails are the corridors where weeds are most common in this analysis area. Weeds may be established with any activity that is associated with a road or trail, and may be further spread by livestock grazing, wildlife, recreationists and/or weather. Mitigations are in place to reduce the possibilities of weed establishment through site specific documents (i.e. Travel Plan).

Past harvest activity on National Forest lands in the analysis area includes a total of approximately 600 acres in the late 1980s – 2004. There were no harvest activities in the Eightmile Allotment, 36 acres in the Rock Creek South Allotment in 1996, 270 acres in the Bald Knob Allotment between 1988 and 1999, and 285 acres in the West Pine Allotment in 1989 and from 2000-2004. The majority of these acres have either been planted or have naturally regenerated. Weed establishment is often associated with timber harvest, due to ground disturbing activities and harvest equipment that may not be weed free. Harvesting on National Forest Lands requires equipment to be washed and disturbed areas to be re-seeded, however, harvest on private lands may or may not have similar requirements. If weeds are established in harvest units within the allotment, they may be further spread by livestock grazing either because of continued disturbance (grazing) or by physical means (seeds that are carried by cattle). If weeds are established in harvest units outside an allotment, they could spread into the allotment by wind, recreationists, and/or wildlife and establish on disturbed sites.

Some activities on private land could have cumulative effects with livestock grazing, while others probably would not. Activities on private land that introduce weeds could spread to the allotments and could displace native vegetation. Displacing native vegetation could result in different grazing patterns for livestock or could cause over-utilization of different areas.

Alternative 3–Adaptive Management

Bald Knob, West Pine, & Eightmile Allotments

Under Alternative 3, any cumulative effects for Bald Knob, West Pine and Eightmile Allotments regarding noxious weeds would be similar to those associated with Alternative 2.

Rock Creek South Allotment

Under Alternative 3, the Forest Service is recommending closure on the Rock Creek South Allotment, thus any cumulative effects regarding noxious weeds would be similar to Alternative 1.

E. Wildlife Species (Threatened and Endangered, Sensitive, Management Indicator, and Migratory Birds)

Scale of Analysis

Temporal Bounds: The effects analysis for wildlife addresses those past, present, and future activities, which may have an affect on these species. Vegetation altering processes can have very long-lasting effects on wildlife habitat. Past activities within the project area include historical livestock grazing and altered fire regimes within the last century.

Spatial Bounds: Effects of this project on wildlife considered activity in those habitats that occur within the individual West Paradise Allotment boundaries. The analysis is limited to those species that utilize all or a portion of the area impacted by the proposed project activity or for which comprehensive analysis is required.

Affected Environment

The West Paradise Allotments lie on the east flank of the Gallatin Range from approximately Trail Creek south to Rock Creek, providing wildlife habitat on both private and public lands for a wide array of wildlife species including songbirds, game birds, raptors, small mammals, forest carnivores, and big game animals. The project area that would be impacted by proposed livestock grazing is comprised of a variety of habitat including lower elevation Douglas fir forest, open grassland and meadows, sagebrush shrublands, aspen, riparian, and high elevation lodgepole and/ or spruce/ fir forest. Timber harvest has occurred on both National Forest and private lands within the allotment boundaries, resulting in various age classes of regenerated forest. These habitats provide for many of the species listed above, as well as more common game and non-game species.

Species Considered

The site-specific area of influence or "project area" includes the lands defined by the individual allotment boundaries as well as any surrounding landscape that defines specific species management analysis units. The analysis for terrestrial species concentrates on the current level and management of livestock grazing and the full scope of the identified adaptive management alternative, and was based on the predicted effects of these disturbances on the appropriate analysis area for the individual species. Analysis also occurs for the effects of no grazing on terrestrial species.

It is unrealistic to individually analyze every species that may be present within the defined analysis areas. Therefore, for the purpose of this project, threatened, endangered, and sensitive, as well as other identified species, are analyzed to represent those that utilize similar habitats. The species that will be further

addressed in this EA include those species listed as threatened and endangered (Canada lynx). Other species to be addressed include sensitive species (grizzly bear, bald eagle, gray wolf, peregrine falcon, flammulated owl, trumpeter swan, harlequin duck, wolverine, Townsend's big-eared bat, black-backed woodpecker), management indicator species (elk, pine marten, Northern goshawk), and migratory birds relative to the relationship of livestock grazing in areas that provide migratory bird habitat.

Management Indicator Species

Management indicator species (MIS) are wildlife species whose habitat is most likely to be affected by management practices thereby serving as indicators of habitat quality. Five terrestrial species are identified as MIS in the Gallatin National Forest Plan1987:II-19 (USDA 1987). These are the grizzly bear, bald eagle, Northern goshawk, pine marten, and elk. The grizzly bear and bald eagle are also sensitive species and will be analyzed in that section. For the West Paradise Allotment revision project, migratory birds are used as an indicator group to measure effects on those habitats such as grassland and riparian habitats impacted by livestock grazing.

Threatened and Endangered Species

Threatened and endangered species are managed under the authority of the Federal Endangered Species Act (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). Section 7 of the Endangered Species Act directs Federal departments and agencies to ensure actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of their critical habitats (16 USC 1536). In addition, Forest Service policy requires that all Forest Service programs and activities need to be reviewed for possible effects on threatened or endangered species (FSM 2672.4).

The only species listed in the project area is the threatened Canada lynx. This species list was confirmed through the FWS website (last updated March 5, 2008):
http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/Forests/
Gallatin_sp_list.pdf. Grizzly bears and bald eagles have been delisted and are now designated as sensitive species. The gray wolf is delisted as of March 28, 2008 and will also be designated as sensitive.

Sensitive Wildlife, Fish, Amphibian & Plant Species

Sensitive species are those species identified by a Regional Forester for which population viability is a concern as evidenced by a significant current or predicted downward trend in population numbers, density, or habitat capability that will reduce species' existing distribution (FSM 2670.5.19).

Protection of sensitive species and their habitats is a response to the mandate of the National Forest Management Act (NFMA) to maintain viable populations of all native and desired non-native vertebrate species (36 CFR 219.19). The sensitive species program is intended to be pro-active by identifying potentially vulnerable species and taking positive action to prevent declines that will result in listing under the Endangered Species Act. Forest Service Manuals (FSM 2670) provide policy under which Forest Service projects are designed to maintain viable populations of sensitive species and to ensure that those species do not become threatened or endangered due to Forest Service actions. The same direction for sensitive wildlife species applies to designated sensitive plant species.

As part of the National Environmental Policy Act (NEPA) decision-making process, proposed Forest Service programs or activities are to be reviewed to determine how an action would affect any sensitive species (FSM 2670.32). The goal of the analysis should be to avoid or minimize impacts to sensitive species. If impacts cannot be avoided, the degree of potential adverse effects on the population or its habitat within the project area and on the species as a whole would be assessed.

Migratory Bird Species

The Migratory Bird Treaty Act requires federal agencies to ensure that environmental analyses of federal actions evaluate the effects of actions and agency plans on migratory birds. Migratory birds are a diverse group including raptors, waterfowl, shore birds, game birds, and songbirds. Migratory bird species are analyzed as an indicator species for those species that may be impacted by livestock grazing, i.e. grassland, shrub/ steppe, riparian, and aspen habitats. There are currently no Forest Plan standards specific to migratory birds.

Direct and Indirect Effects

Effects Common to the Action Alternatives (2 & 3)

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Management Indicator Species

Pine Marten

The pine marten is an indicator for mesic old growth habitat consisting of spruce/ fir forest types. The marten is strongly associated with forested habitat with concentrations of dead and down woody material. These forest types offer little forage or access and are considered unsuitable for livestock grazing. Livestock grazing is not expected to have any measurable affect on this species or its habitat. Also, Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. Specific to pine marten, no significant changes have occurred in patch size or habitat connectivity in mapped habitat from historic levels. In addition, there is adequate habitat on the Gallatin Forest to maintain species viability. Therefore, the issue relative to livestock grazing effects on pine marten is dismissed from further detailed analysis.

Goshawk

The Northern goshawk was removed from the Regional Forester's sensitive species list (USDA 2007a). Regional data collection and analysis demonstrated that requirements to be a sensitive species as outlined in The Forest Service Manual (2670.5) no longer existed; therefore, the species no longer meets the definition for "sensitive." The goshawk continues to be considered as a management indicator species.

The goshawk is an indicator for old growth habitat consisting of dry Douglas fir forest types. Livestock are not expected to affect goshawk nesting habitat as they primarily nest in mature conifer forests. Goshawks forage in a variety of open and forested communities and prey on small mammals and birds. These are habitats that seldom produce much forage and are considered unsuitable for livestock grazing but may be used by livestock for incidental forage and/or shade. Livestock could slightly alter grassland habitat where prey may be located. With the adaptive management alternative, implementation of utilization levels in riparian and aspen communities would maintain or improve goshawk habitat. Under current management, livestock are not impacting dry Douglas fir mature or old growth forest to any measurable degree.

Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. Their analysis of goshawk nesting habitat revealed abundant potential habitat on the Gallatin Forest. Samson (2005) conducted a conservation assessment for the northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker in Region 1. Short-term viability is not an issue as well-distributed and abundant habitat exists on today's landscape for these species. Long-term viability assessment relates to

the sustainability of habitat conditions in which the species have persisted for an extended period of time (>100 years). Due to changes in habitat moving away from historic, such as loss of grasslands and the increases in intermediate-aged forests and the increased connectivity of the landscape, Samson (2005) gave a low for habitat Representativeness, Redundancy, and Resiliency in the long-term. This long term potential effect is outside the scope of the West Paradise Allotment revision proposed action and alternatives. At the same time the goshawk was taken off the sensitive species list, additional guidance for goshawk was developed (Brewer et. al. 2006) that may be used as a tool to analyze project impacts for the northern goshawk where habitat occurs. However, habitat for goshawk, and other species dependent on dry Douglas-fir old growth, would not be affected to any measurable degree by livestock grazing. For the West Paradise allotment analysis, the goshawk is dismissed from further detailed analysis.

Elk

Elk are the MIS species designated as the indicator for big game habitat. Use of the area by elk may occur year-round depending on elevational gradients and annual climactic patterns across the landscape in relation to allotment boundaries. Potential issues affecting elk include competition for forage and space. There can be high dietary overlap between livestock and elk which can result in a reduction of annual forage and ultimately in a long-term change in forage composition to less desirable species. On the West Paradise Allotments, forage competition would be least likely to occur during the summer months as elk generally use summer range that is at higher elevations than the livestock are permitted to graze; summer range is not limiting on National Forest. Indirect forage competition may occur if forage required by elk was consumed by livestock in the previous grazing period such that it was not available during the winter period. Winter range generally occurs on open, south-facing, windswept ridges free of snow that are categorized as secondary livestock range; primary livestock range would consist of less steep terrain and bottoms which are normally unavailable to grazing animals during the winter due to snow cover. Vegetation conditions on uplands and in riparian areas within the West Paradise Allotments indicate that sufficient production of forage and annual utilization would not result in a lack of forage availability. Any direct or indirect competition is variable based on annual climactic conditions and may even serve to improve foraging conditions for elk through removal of residual vegetation.

Spatial competition may occur if both livestock and elk utilize areas during the same time period or if livestock displace elk from preferred to more marginal grazing areas. Elk do tend to avoid livestock but are better able to adapt to terrain that is less suitable for livestock. However, elk may move to alternative habitats for security or for other needs even in the absence of livestock. Conversely, spatial overlap may also produce positive effects of

increased forage palatability due to the removal of litter. There is no indication that spatial competition is an issue on the West Paradise Allotments.

The West Paradise Allotments lie within Hunting District (HD) 314, which is basically the east flank of the Gallatin Range from Bozeman Pass on the north to the West Fork of Sphinx Creek, south of the project area. HD 314 is part of the Gallatin/Madison EMU (Elk Management Unit) which also consists of HD 301, 310, 311, 360, 361, and 362. The Northern Yellowstone EMU lies to the east and south of the project area in HD 313. Except for a small herd of resident elk in the Sixmile Creek area, elk seasonally migrate out of Yellowstone National Park to spend 4-5 months during the winter and early spring in this adjacent EMU.

According to the Montana State Elk Plan (Montana Department of Fish, Wildlife, and Parks 2004b), elk population objectives for the Gallatin/Madison EMU is to maintain a post-season population of 2,400-3,600, or 20% of 3,000 elk. According to results from Montana Fish, Wildlife, and Parks (MFWP) elk surveys for Hunting District 314 that includes the West Paradise Allotments, the number of elk observed during the 2006 survey was the highest count since surveys began in 1974 with 4,743 elk observed, with the second and third highest counts occurring in 2005 and 2002 (Lemke, office memorandum). This total population count includes individual elk herds outside of the West Paradise Allotment boundaries. Table 3-12 below displays the population objective and current survey counts for those portions of West Paradise Allotments within HD 314.

Table 3-12– Elk Herd Population Objectives and Survey Trends

Individual Herd Location within HD 314	Corresponding Allotment in West Paradise Project Area	Montana State Elk Plan Objective (in numbers of elk)	Current Survey Results (in numbers of elk) 2006 Survey
Wineglass to West Pine Creek	Bald Knob and a portion of West Pine	1,000	1,294
West Pine Creek to Eightmile Creek	Portion of West Pine and Eightmile	300	947
Point of Rocks to Rock Creek	Rock Creek South	450	749

Elk numbers have been increasing throughout HD 314 and elk population goals have been met. Based on increasing elk numbers, the MFWP liberalized

the general elk season in 2004 to increase the harvest level. Since that time, the general elk license regulation included either sex during the entire general and bow hunting seasons. This information suggests there is no apparent effect of current livestock grazing operations on elk within this HD. Proposed allotment revision with identified adaptive management practices would serve to maintain grassland/ shrubland, riparian and aspen habitats, potentially increasing the attractiveness and suitability of these sites across the larger landscape that elk utilize. As evidenced by the elk population trends and vegetation conditions consistent with desired objectives, forage and spatial competition were dismissed from further detailed analysis.

The Forest Plan has designated elk as a MIS for big game habitat under the premise that by managing for productive elk habitat, we will be managing for most big game species. These include mountain goat, moose, bighorn sheep, and mule deer. Issues identified affecting big game species other than elk include forage and woody browse competition.

Use by mule deer, and incidental use by whitetail deer, occurs throughout the project area. Forage preferences for deer differ from livestock. Mule deer seek grasses early in the spring but switch to forbs and shrubs as the grazing season progresses. Deer hunting regulations suggest that populations are thriving as either sex and/or antlerless permits are offered. Mountain goats and bighorn sheep also occur in the project area and are generally found in areas considered unsuitable for livestock grazing. Mountain goats naturally immigrated to the Gallatin Range from neighboring introduced populations. Bighorn sheep migrate from winter to summer range through the project area but do not overlap with timing of permitted livestock use dates. Livestock do not overlap habitat or spatial requirements with mountain goats or bighorn sheep.

Moose are associated with deciduous riparian vegetation, aspen, and adjacent forest canopies and do occur throughout the project area. Livestock grazing may directly compete with moose for browse during the fall season when protein content of preferred grass species is lowered. Livestock may also affect moose habitat by degrading streamside habitat through trampling or rubbing such that deciduous vegetation is reduced and regeneration is compromised. Current grazing of riparian areas is controlled through deferment, herd management practices such as salting, and/or limiting grazing intensity or timing. The no grazing alternative and the adaptive management alternative would not incur further impacts than those already occurring to some degree in the riparian and conifer forest habitats. The riparian areas within the West Paradise Allotments are within vegetation objectives for the project area and there were no key issues related to these habitats. Forage and woody browse competition with other big game species were dismissed from further detailed analysis.

Threatened, and Endangered Species

Lynx

The Canada lynx was listed as a threatened species under the ESA in March 2000. Management direction for lynx is now guided by the Northern Rockies Lynx Management Direction Record of Decision (NRLA) (USDA 2007b). This decision amended all Region 1 Forest Plans to incorporate this direction and applies to occupied, mapped lynx habitat. The amendment contains goals, objectives, standards (management requirements), and guidelines (management actions normally taken) for project and activity decision making. The NRLA application of standards and guidelines are meant to substantially reduce the potential for adverse effects on lynx.

The lynx is a medium sized cat associated with forested environments. Lynx require a range of habitat conditions for survival and reproduction. Forest cover is preferred for travel, resting and hunting. In general, lynx habitat on the Gallatin National Forest is defined as coniferous forest in the elevation range between 6,000 and 8,800 feet with habitat types where spruce or subalpine fir is the indicated climax species.

According to the Gallatin National Forest lynx habitat map, the West Paradise Allotments are within the East Gallatin LAU and do have vegetation communities mapped as lynx habitat. Both National Forest and private land portions of the West Paradise Allotments contribute to lynx habitat and are considered occupied. Table 3-13 summarizes the National Forest (FS) lands within each allotment that are mapped as lynx habitat and how much overlaps with suitable livestock grazing lands.

Table 3-13 FS Acres of East Gallatin LAU Lynx Habitat Within West Paradise Allotments

Allotment Name	Total FS Acres Suitable for Livestock	Total FS Acres Lynx Habitat	Type of Lynx Habitat	Intersection of Suitable Lynx Habitat
Bald Knob	34	557	Conifer	7
West Pine	743	454	Conifer	63
Eightmile	1,068*	1,361	Conifer/ sage	42
South Rock	1,068	3,280	Conifer/ sage/ aspen	430

* This figure includes private land within the allotment that provides suitable livestock grazing land

The intersection was derived from overlapping mapped lynx habitat and suitable livestock grazing land. Suitable livestock grazing was modeled as

non-tree vegetation that was less than 40% slope. As indicated in the table, there is very little overlap between suitable livestock grazing land and lynx habitat. The potential lynx habitat on the allotments tends to be forested and therefore, not conducive to livestock grazing. Other lynx habitat components contiguous with modeled conifer habitats include sagebrush, aspen, and willow, which are present in small quantities on the Eightmile and Rock Creek South Allotments. Riparian areas, or areas of conifer with grass understory, were not part of this model and tend to be linear features that are clumped with the adjacent vegetation communities. Areas of conifer with grass understory are a dry forest type and would generally not be considered lynx habitat due to the inherent low moisture regime that supports grass over vegetation needed to support snowshoe hare. The model also did not include distance from water which is a factor in predicting livestock use. While the intersection does not take in all the factors related to how lynx and livestock use the landscape, it was a way to surmise the potential risk of adverse grazing effects on lynx habitat.

According to the Canada Lynx Conservation and Assessment Strategy (LCAS) (Ruediger and others 2000), livestock may reduce or eliminate forage resources available to snowshoe hares and other prey species in these habitats if it alters the structure or composition of native plant communities, particularly aspen and willow. Grazing throughout the Rocky Mountains has contributed to the decline of aspen, which as a well-developed young stand provides quality habitat for snowshoe hares and other lynx prey items (Ruediger and others 2000). Grazing has also degraded high elevation willow communities, another component of snowshoe hare habitat.

The new direction (USDA 2007b) determined that management direction for livestock grazing in lynx habitat should be in the form of guidelines because there was no evidence that grazing adversely affects lynx, i.e. there are no required standards. The guidelines provide project design criteria and are designed to minimize potential adverse affects to individual lynx and improve habitat conditions. The FWS found that with the application of these measures there would be no or discountable effects to lynx. Table 3-14 responds to applicable management direction pertinent to the West Paradise Allotment revision proposal.

Table 3–14 NRLA Management Direction for All Management Practices/ Activities and Livestock Management and Compliance with West Paradise Alternatives 2 & 3

NRLA Management Direction	Alternatives 2 & 3 Compliance
ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL)	Y/N
Objective ALL O1 Maintain or restore lynx habitat connectivity in and between LAUs, and in linkage areas.	Y
Standard ALL S1 New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.	Y
Guideline ALL G1 Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses, or overpasses.	N/A
Standard LAU S1 Changes in LAU boundaries shall be based on site specific habitat information and after review by the Forest Service Regional Office.	N/A
LIVESTOCK MANAGEMENT (GRAZ)	**Y/N**
Objective GRAZ O1 Manage livestock grazing to be compatible with improving or maintaining lynx habitat.	Y
Guideline GRAZ G1 In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.	Y
Guideline GRAZ G2 In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.	Y
Guideline GRAZ G3 In riparian areas and willow carrs, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.	Y

NRLA Management Direction	Alternatives 2 & 3 Compliance
Guideline GRAZ G4 In shrub-steppe habitats, livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.	Y

The majority of the vegetation on the West Paradise Allotments either do not provide lynx habitat or are not considered suitable for livestock. The action alternatives include utilization standards for uplands and riparian areas, as well as potential range improvement structures designed to maintain or improve rangelands through better livestock distribution. Where livestock grazing occurs within or near lynx habitat, these proposals will ensure regeneration of shrubs and trees where fire or logging has occurred, provide for aspen sprouting and survival sufficient to perpetuate long-term viability of the clones, maintain or achieve mid-seral or higher condition shrub-steppe to provide lynx habitat matrix, and maintain or achieve mid-seral or higher condition riparian areas or willow carrs to provide cover and forage for prey species. These conditions either currently exist or are not meeting these guidelines due to impacts from sources other than livestock grazing such as roads, past logging, or fire.

Continued livestock grazing, or the removal of livestock, is not expected to create further impacts than what has already occurred over time. Therefore, the Forest Service is adhering to direction in the NRLA (USDA 2007b). Also, Cherry and Tyers (unpublished paper) indicate that population viability of lynx does not appear to be a concern. The alternatives were found to have *"no affect"* on lynx. The actions proposed such as improving livestock distribution, constructing additional water sources, implementation of riparian utilization guidelines, and adaptive management strategies would maintain or improve riparian and upland conditions, thus maintaining or improving foraging opportunities for lynx prey. Issues relative to livestock grazing effects on the lynx may be eliminated due to all design criteria guidelines being met and were dismissed from further detailed analysis.

Sensitive Species (Fish, Amphibian, & Wildlife)

Fish Species

Sensitive species are those plants and animals identified by the Regional Forester for which population viability is of concern. A Biological Evaluation (BE) is required to determine how a proposed action may affect any sensitive

species. Fish species listed as 'sensitive' on the GNF include Arctic grayling (*Thymallus arcticus*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), and Yellowstone cutthroat trout (*O. clarki bouvieri*). Of these species, Arctic grayling and westslope cutthroat trout are not native to the Yellowstone River drainage. With the exception of Sixteenmile Creek, streams throughout the project area are within historically occupied habitat for Yellowstone cutthroat trout. Yellowstone cutthroat trout surveys have been conducted in all streams throughout the project area (see Affected Environment narrative).

Based on the above effects analysis, I have reached the following determinations for Yellowstone cutthroat trout. For Alternatives 1, 2 and 3, grazing would have *no impact* on YCT. Detailed rationale for this determination is included in the effects analysis of this report.

Amphibian Species

There are two GNF sensitive amphibians, the northern leopard frog and the Boreal (Western) toad. Northern leopard frogs breed from mid-March to early June (Maxell 2000). Mating occurs when males congregate in shallow water and begin calling during the day (Maxell 2000). Eggs are laid at the water surface in large, globular masses of 150 to 500 (Maxell 2000). Young and adult frogs often disperse into marsh and forest habitats, but are not usually found far from open water (Maxell 2000). Overwintering habitat is the bottom of permanent water bodies, under rubble in streams, or in underground crevices. During a Gallatin National Forest survey in 1999, Northern Leopard frogs were found only on the Bozeman Ranger District with a second potential sighting on the Gardiner Ranger District. None have been found in the West Paradise analysis area, but additional surveys are necessary to validate their distributional range and presumed absence from the project area. Suitable habitat does exist throughout the project area.

Western toads inhabit all types of aquatic habitats ranging from sea level to 12,000 in elevation (Maxell 2000). They breed in lakes, ponds, and slow streams, preferring shallow areas with mud bottoms (Maxell 2000). Western toads breed from May to July, laying long, clear double-strings of eggs (Maxell 2000). Tadpoles metamorphose in 40 to 70 days (Maxell 2000). Because of their narrow environmental tolerance (10-25 C throughout the year), adults must utilize thermally buffered microhabitats during the day, and can be found under logs or in rodent burrows (Maxell 2000). Adults are active at night and can be found foraging for insects in warm, low-lying areas (Maxell 2000). Western toads overwinter in rodent burrows and underground caverns. Prior to 2007 surveys for this analysis, Western toads were not found on the east side of the Gallatin Range (Atkinson and Peterson 2000). Suitable habitat exists throughout the project area, but additional surveys are needed to validate their distributional range. A Western Toad was found in the low gradient reach of Eightmile Creek within the allotment near the forest

boundary.

Under existing grazing management (Alternative 2), habitat degradation is not occurring in the lower reach of Eightmile Creek. There was little evidence of cattle use in that reach. Thus, grazing under Alternative 2 would have *no effect* on Western toads. For Alternative 1 (No Grazing) and Alternative 3 (Adaptive Management), riparian health is anticipated to remain in a healthy, functional condition. As such, it is reasonable to assume that habitat conditions for amphibians will remain suitable where they occur. Even though northern leopard frogs have not been found, habitat for both species would be suitable. Therefore, *no effect* is anticipated with these two alternatives for either species.

The project area does not provide suitable habitat, or will not effect to any measurable degree, habitat for the bald eagle, grizzly bear, peregrine falcon, trumpeter swan, harlequin duck, flammulated owl, wolverine, black-backed woodpecker or Townsend's big-eared bat so these species only briefly addressed in this analysis for potential impacts from the proposed project.

Bald Eagle

The West Paradise Allotment revision project area lies within the Bighorn Recovery Zone, which has a target of 11 nesting pairs as identified in the Montana Bald Eagle Management Plan 1994 (USDI 1994). The target of 11 nesting pairs was achieved several years ago.

The bald eagle was addressed as a designated sensitive species since the delisting by the FWS officially occurred in August of 2007 (USFWS 2007a). The delisting determination was based on a thorough review of the best available scientific and commercial information, which indicates that the threats to this species have been eliminated or reduced to the point that the species has recovered. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. Prior to delisting, the bald eagle was considered per the Programmatic Biological Assessment for Activities that are Not Likely to Adversely Affect Listed Terrestrial Species (USDA 2004), use of decision screens (updated in 2006), and concurrence letter (USFWS 2007c) for those projects that fit within the programmatic screening process. These screens still provide valuable guidance and are still valid despite the bald eagle delisting.

Livestock grazing is not expected to have any measurable effect on this species or its habitat. The bald eagle is typically associated with large lakes (> 80 acres) and major river courses (USDI 1994). They feed primarily on fish and carrion. The project area does not include any known bald eagle nesting territory. Bald eagles are known to occur during both summer and

winter along the Yellowstone, located a few miles to the east of the project area. The West Paradise allotments do not lie within any bald eagle nest site management zones, do not permit structures that pose a risk to bald eagles or their prey within foraging areas, and do not increase road kills in foraging habitat.

The bald eagle exceeds recovery criteria, has been delisted, and is protected by adherence to the Montana Bald Eagle Management Plan (USDI 1994), the Bald and Golden Eagle Protection Act (Eagle Act), and the Migratory Bird Treaty Act (MBTA). In addition, the National Bald Eagle Management Guidelines (USFWS 2007d) were developed by the FWS to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities. These guidelines focus on avoidance of nesting and foraging areas; no provisions for livestock grazing or other rangeland operations would apply to the West Paradise Allotment revision project. Mitigation for bald eagle in the form of a grazing permit Part 3 modification also includes additional protection for the recently delisted bald eagle. The alternatives were found to have *"no impact"* as the project would not affect nesting or foraging habitat. Therefore, the issues relative to livestock grazing effects on bald eagle are dismissed from detailed analysis.

Grizzly Bear

The grizzly bear was listed as a threatened species under the ESA until the species' delisting by the FWS (USFWS 2007b). The delisting determination was based on a thorough review of the best available scientific and commercial information, which indicates that robust population growth, coupled with State and Federal cooperation to manage mortality and habitat, widespread public support for grizzly bear recovery, and the development of adequate regulatory mechanisms has brought the Yellowstone grizzly bear population to the point where making a change to its status is appropriate.

Prior to delisting the final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem (ICST 2003), the Grizzly Bear Management Plan for Southwestern Montana: final programmatic environmental impact statement 2002-2012 (MFWP 2002), and the Forest plan amendment for grizzly bear habitat conservation for the greater Yellowstone area national forests record of decision (USDA 2006) were completed. The Forest Plan Amendment included management direction for the Gallatin National Forest, both within and outside the PCA boundary.

The West Paradise Allotments do not lie within the PCA for grizzly bears but are north of the Gallatin 3 subunit of the Gallatin Bear Management Unit (BMU). However, the project area is within the area where bears occur. Suitable habitat exists and grizzly bears are known to use the area. In the

Greater Yellowstone Area, grizzly bear occurrence and reports of occurrence outside the recovery zone boundary have been increasing over time, throughout the ecosystem.

Grizzly bear issues related to livestock grazing generally involve depredation of livestock by grizzly bears, disposal of livestock carcasses, storage of human food and stock feed, and grizzly bear habituation, food conditioning and mortality risk associated with these activities. Grizzly bears are more likely to feed on dead livestock that died for other reasons than to prey on live cattle. A grizzly bear clause was added to those livestock permits within the recovery zone in the early 1980's when the grizzly bear was first listed as a threatened species in order to prevent confrontation or conflict between humans and grizzly bears. No livestock related grizzly bear mortalities occurred within the project area through 2007.

According to the State Plan, issues of livestock depredation are dealt with by USDA Wildlife Services Agency (WS), and FWP anticipates them to continue to be the lead agency (MFWP 2002). WS and the Forest Service have a signed Memorandum of Understanding (MOU) to identify responsibilities and establish guidelines for the management of wild vertebrates causing damage on National Forest System lands. In the the delisted grizzly bear Yellowstone area, WS and MFWP (Kevin Frey) work together in the case of grizzly bear depredation. WS investigates the depredation, FWP decides the fate of the bear, and both agencies may be involved in capture and handling. According to the Annual Wildlife Damage Management Plan (APHIS-WS 2008), no bears, wolves or lions were removed from Gallatin National Forest system lands.

The focus of FWP management of grizzly bears and livestock will be on preventive programs to minimize potential livestock conflicts. For example, on the Rocky Mountain Front, FWP has a program to redistribute livestock carcasses from around buildings or calving/lambing areas to areas where they remain available to bears. These types of programs will be evaluated for use within the GYE.

There are currently no standards relative to livestock grazing in the Forest Plan Amendment (USDA 2006) specific to grizzly bears for management actions outside the PCA. Prior to delisting, the grizzly bear was considered per the Programmatic Biological Assessment for Activities that are Not Likely to Adversely Affect Listed Terrestrial Species (USDA 2004), use of decision screens (updated 2006), and concurrence letter (USFWS 2007c) for those projects that fit within the programmatic screening process. These screens still provide valuable guidance and are still valid despite the grizzly bear delisting. The screening criteria as identified in the programmatic BA Grizzly Bear Screening Process Part 2 was considered to determine if livestock grazing has an effect on grizzly bears that occur outside the PCA but within

the distribution area of grizzly bears.

According to the grizzly bear project screening elements, livestock grazing may be maintained or reduced from existing levels if no depredation has taken place historically.

There is no history of livestock depredation or control actions on the West Paradise Allotments. Livestock grazing would not increase or be grazing in new areas. The grizzly bear is protected by adherence to the constraints stipulated in the Forest Plan amendment (USDA 2006). Mitigation for grizzly bear in the form of a grazing permit Part 3 modification does include additional protection for the recently delisted grizzly bear. Also, Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. The alternatives were found to have *"no impact"* on the grizzly bear. The issue relative to livestock grazing effects on grizzly bear is dismissed from further detailed analysis. Issues relative to livestock grazing effects on the grizzly bear may be eliminated from detailed analysis.

Gray Wolf

The gray wolf was listed as a non-essential experimental species under the ESA until the species' delisting by the FWS (USFWS 2008). The delisting determination was based on the best scientific and commercial data available, which indicates that the Northern Rocky Mountains distinct population segment has exceeded its biological recovery goals and that all threats in the foreseeable future have been sufficiently reduced or eliminated. Prior to delisting, the Gray Wolf Recovery Plan delineated 3 recovery zones within Idaho, Montana and Wyoming and was approved in 1987 (USFWS 1987). Gray wolves were reintroduced to the Greater Yellowstone Ecosystem in 1995 and 1996. The Livingston Ranger District is within the Greater Yellowstone Wolf Recovery Area and wolves were listed as a non-essential experimental population. Since the original animals were released in Yellowstone National Park, they have begun to spread throughout the ecosystem as expected.

Habitat is available in the West Paradise Allotments for wolves and their primary prey, elk. Management emphasis for gray wolves is directed at maintaining sustainable populations of wolf prey species, primarily ungulates. As described above, livestock grazing is not expected to have any measurable effect on elk or its habitat. The elk population within the project area and hunting district is at the highest ever recorded. Elk habitat within the project area and surrounding landscape would still be available to elk on National Forest and adjacent private land. Livestock grazing under the action alternatives will not prohibit the movement of elk or impede movement corridors by altering vegetation patterns. Other key ungulate habitat components including cover, security areas, and road densities would remain unchanged with the proposed action or any of the alternatives. Livestock

grazing will have no impact on motorized route density or hiding cover.

The primary issue affecting the gray wolf is wolf/ livestock depredation within the allotments for which allotment plan revision is proposed. Wolf packs have loose territories along the east flank of the Gallatin Range. Gray wolves are habitat generalists, and make use of a wide variety of habitat types throughout the course of their lives. There are denning and rendezvous sites for the Lone Bear, Mill Creek, and Sheep Mountain packs across the landscape, but none of these are known to occur within the allotments' boundaries. Individuals from these packs have been lethally removed due to livestock depredations on private land in the Paradise Valley. However, re-colonization is expected.

There is a concern that livestock will suffer wolf depredation causing economic loss to area ranchers and that the depredating predators will have to be removed, thus compromising wolf recovery. Wolf depredation on cattle has been confirmed on National Forest lands on allotments outside of the project area. These wolves have been targets of lethal control conducted by the WS in conjunction with the FWP. According to the Annual Wildlife Damage Management Plan (APHIS-WS 2008), the depredation incidents included 10 calves killed by wolves, well outside the project area. Depredations occurred in the East Boulder, West Boulder, Trail Creek, Dome Mountain, and Tom Miner basin. Three wolves were removed by WS and one was taken by a rancher with a shoot on sight permit. Overall, population objectives for the recovery of the gray wolf have been met.

If wolves kill livestock, wolf control would take place as outlined in the Montana State Wolf Recovery plan (MFWP 2004a). The issue of livestock grazing effects on the gray wolf relative to considering options for the control of wolves is outside the scope of this analysis and is dismissed from further detailed analysis. Mitigation for gray wolf in the form of a grazing permit Part 3 modification does include additional protection for the recently delisted gray wolf. This information details the permittee rights and responsibilities relative to wolf depredation of livestock on permitted grazing allotments on National Forest. The alternatives were found to have *"no impact"* on the gray wolf. Issues relative to livestock grazing effects on the gray wolf may be eliminated from detailed analysis.
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Peregrine Falcon

Peregrine falcon nest sites exist in Paradise Valley and may occur within the project area. Livestock do not generally affect nesting habitat of falcons due to the generally steep location of nest sites. Any cliffs used for potential eyries would not be considered suitable grazing land that livestock would utilize. No direct effects are anticipated. All of the activities proposed in the alternatives would lead to maintenance or recovery of riparian and upland habitats which

provide niches for prey species. Foraging habitat would be maintained or improved through proposed livestock grazing practices. Any indirect effects would be immeasurable. There are no known existing eyries or foraging areas in the project area although some potential habitat exists near Chimney Rock on private land near the West Pine Creek allotment. Also, Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. When necessary, peregrine falcon habitat is protected through site-specific mitigation and special management constraints. Therefore, the proposed grazing allotment revision would have "*no impact*" on the peregrine falcon. The issue relative to livestock grazing effects on pine marten is dismissed from further detailed analysis.

Trumpeter Swan

Trumpeter swan would not be affected because suitable habitat does not exist in the area. Habitat requirements include fairly large bodies of water. For this reason, it is determined that livestock grazing will have "*no impact*" on trumpeter swan. For the West Paradise allotment analysis, the trumpeter swan is dismissed from further detailed analysis.

Harlequin Duck

Harlequin duck inhabits swift streams, which do not occur on any of the allotments. The streams within the project area are very small and are not typical of their preferred habitat. Therefore, the proposed grazing allotment revision would have "*no impact*" on the harlequin duck. For the West Paradise Allotment analysis, the harlequin duck is dismissed from further detailed analysis.

Flammulated Owl

Associated with seral and climax late-successional forests, these owls are a secondary cavity nester which feeds almost exclusively on insects. They require an adequate insect forage base and larger snag component. They have been observed in a variety of habitats but prefer mature, open-grown stands of ponderosa pine and Douglas fir. To date, no occurrences have been documented within the project area. Flammulated owls are strongly associated with open ponderosa pine habitat, which does not occur within or near the allotments. However, aspen and dry open Douglas-fir habitats are present on the allotments and may also be used by flammulated owls.

The issue paper originally written to address range permit reissuance addresses population status, life history, habitat, mortality factors, and potential effects relative to livestock grazing (Maj et al., unpublished paper). Because flammulated owls are cavity nesters, there would be no direct or indirect effects on nesting from the West Paradise Allotment revision

proposed action or alternatives. Forest/grassland edges are preferred foraging. There is a very small risk of change in the prey base by altering grassland habitat where prey may be located. Livestock could have minor indirect effects through changes in vegetative composition that may alter the availability of prey species. Currently these vegetation communities are in good condition. Implementation of proper livestock levels, management actions such as deferment, and all the adaptive management strategies would maintain or improve flammulated owl habitat.

Samson (2005) conducted a conservation assessment for the northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker in Region 1. Short-term viability is not an issue as well-distributed and abundant habitat exists on today's landscape for these species. The long-term viability assessment relates to the sustainability of habitat conditions in which the species have persisted for an extended period of time (>100 years). Due to changes in habitat moving away from historic, such as loss of grasslands and the increases in intermediate-aged forests and the increased connectivity of the landscape, Samson (2005) gave a low for habitat Representativeness, Redundancy, and Resiliency in the long-term. The feeding habitat for the flammulated owl may become more limited due to the secondary growth associated with the lack of fire activity in these habitats. However, this long term potential effect is outside the scope of the West Paradise Allotment revision proposed action and alternatives. It is determined that livestock grazing would have "*no impact*" on flammulated owl. For the West Paradise allotment analysis, the flammulated owl is dismissed from further detailed analysis.

Wolverine

Wolverines are medium sized forest carnivores thought to be secretive and to stay in forest cover as much as possible. Generally speaking, wolverines are opportunistic omnivores in summer and primarily scavengers in winter. During summer, wolverines are associated with high elevation and alpine areas. Since wolverines are basically habitat generalists with an opportunistic foraging strategy, it can be assumed that any of the allotments may provide foraging habitat for wolverine. During the winter they occupy areas where prey is available. Females den at relatively high elevations in mature and old growth forests, as well as large-boulder talus fields and mountain cirques, which would not be considered suitable grazing land that livestock would utilize. No direct or indirect affects are anticipated in denning areas.

The issue paper originally written to address range permit re-issuance addresses population status, life history, and potential effects relative to livestock grazing (Warren et al., unpublished paper). Livestock grazing has the potential to have direct and indirect effects on wolverine or its foraging habitat. Direct effects may include predator control which may inadvertently

result in wolverine mortality. Indirect effects such as trampling or over utilization of forage may reduce prey abundance. The actions proposed such as improving livestock distribution, constructing additional water sources, implementation of riparian utilization guidelines, and adaptive management strategies would maintain or improve riparian and upland conditions, thus maintaining or improving foraging opportunities for wolverine prey. Therefore, for the West Paradise Allotments, there are no anticipated effects on the wolverine. Also, Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. The main issue with the wolverine is snowmobile activity, which is not addressed in this analysis. For this reason, it is determined that livestock grazing will have "*no impact*" on wolverine. For the West Paradise Allotment analysis, the wolverine is eliminated from detailed study.

Black-backed Woodpecker

Black-backed woodpeckers are primary cavity nesters and prefer burned or dead forest with numerous snags containing wood boring insects. There is available habitat within the project area. However, the habitats they use are not considered suitable for grazing and are not likely to be impacted by grazing.

Samson (2005) conducted a conservation assessment for the northern goshawk, black-backed woodpecker, flammulated owl and pileated woodpecker in Region 1. Short-term viability is not an issue as well-distributed and abundant habitat exists on today's landscape for these species. The long-term viability assessment relates to the sustainability of habitat conditions in which the species have persisted for an extended period of time (>100 years). Due to changes in habitat moving away from historic, such as loss of grasslands and the increases in intermediate-aged forests and the increased connectivity of the landscape, Samson (2005) gave a low for habitat Representativeness, Redundancy and Resiliency in the long-term. This long term potential effect is outside the scope of the West Paradise Allotment revision proposed action and alternatives. Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. The black-backed woodpecker appears to be using newly available habitat created in recent years through significant fire events. Also, Bonn etc. al. (2006) developed a consistent approach towards addressing the species and its habitat over time across the Northern Region. However, habitat for black-backed woodpecker would not be affected to any measurable degree by livestock grazing. Therefore, the proposed grazing allotment revision would have "*no impact*" on the black-backed woodpecker. For the West Paradise Allotment analysis, the black-backed woodpecker is dismissed from further detailed analysis.

Townsend's Big-eared Bat

Big-eared bats forage for insects at night, often in and above open-grown mature forests. They are very sensitive to human disruption of roosts and hibernacula. Limestone cliffs and rock outcrops may provide roosting and hibernating habitats. Individuals may also roost in snags and old trees. These micro-habitats may occur on the allotments but would not be considered suitable livestock grazing.

The issue paper originally written to address range permit reissuance addresses population status, life history, habitat components, and potential effects relative to livestock grazing (Torquemada and Cherry, unpublished paper). There are no known direct effects to Townsend's big-eared bat due to livestock grazing. Minor indirect effects may occur due to altering the prey base of bats (insects), alteration of water resources, alteration of cave microclimate, or by permittees entering caves in which bats may inhabit.

If the Townsend's big-eared bat does occur in the project area, livestock grazing would have no direct effect on their habitat. There may be some slight indirect effects of livestock grazing on their prey base, particularly at water sources, but these are immeasurable. Implementation of actions proposed such as improving livestock distribution, constructing additional water sources, implementation of riparian utilization guidelines, and adaptive management strategies would maintain or improve riparian and upland conditions, thus maintaining or improving foraging opportunities for the Townsend's big-eared bat. Also, Cherry and Tyers (unpublished paper) indicate that population viability does not appear to be a concern. The biggest risks to cave-using bats, such as Townsend's big-eared bat, are loss of suitable roost sites and direct disturbance of bats in caves. For this reason, it is determined that livestock grazing would have "*no impact*" on Townsend's big-eared bat. For the West Paradise Allotment analysis, the Townsend's big-eared bat is dismissed from further detailed analysis.

Sensitive Plant Species

The issue is the potential effect of livestock grazing on sensitive plants that may occur on the allotments. Sensitive plant species that have a moderate vulnerability to grazing include: *Gentianopsis simplex*, *Juncus hallii*, *Salix barrattiana*, and *Eriophorum gracile*. Only one occurrence is documented for *Eriophorum gracile* and *Gentianopsis simplex* (Madison County and the Bridger Mountains respectively) on the Gallatin Forest. No occurrences of *Juncus hallii* or *Salix barrattiana* exist for the Gallatin Forest. If these plants did occur within the project area, livestock grazing may impact these sensitive species.

Currently there are 19 plant species designated as sensitive on the Livingston Ranger District. Sensitive plant surveys were conducted on National Forest lands in the West Paradise Allotment project area. Surveys conducted during 2007 focused on those habitats that would support the species considered moderately vulnerable to grazing on sites highly likely to contain sensitive plants. For the species identified above, wet, organic soil of fens in the valley and montane zones; mountain bogs, meadows, seeps, often in areas of crystalline parent material, in montane and subalpine zones; moist to dry meadows and slopes, valley to subalpine; cold, moist soil near or above timberline were inventoried. Upland areas and timbered areas most frequented by livestock were not targeted as they do not provide habitat for these species or are not extensively used by livestock. No sensitive plants were found on any of the allotments during the surveys. Surveyors also noted that sensitive plants most likely do not occur, based on lack of potential habitat. Therefore, it is unlikely that grazing by livestock in the West Paradise Allotments would affect sensitive plants. Livestock grazing in this project area would have "*no impact*" on sensitive plant species suspected or known to occur on the Gallatin National Forest due to lack of potential suitable habitat or absence of plants based on completed surveys. Sensitive plants will not be further addressed.

Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703-711). A January 2001 Executive Order requires federal agencies to ensure that environmental analysis of federal action evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern. Migratory birds utilize a vast array of habitats for nesting and foraging from grassland/ shrublands, conifer forests, riparian areas, and deciduous trees and shrubs. Habitats found in the analysis area are grasslands, shrub-steppe, conifer forest, riparian, and aspen.

Issues identified affecting birds include nesting habitat, food sources, and nest parasitism of neotropical migrants, adequate plant succession and/or stubble height to produce a prey base (insects) for upland game birds, and grazing impacts on small mammal habitat and abundance serving as prey base for larger raptors. Migratory birds that occur in grassland, shrub-steppe, conifer, riparian, and aspen habitats are briefly discussed here but not analyzed in detail. Those habitats associated with riparian vegetation and aspen are the most vulnerable habitats to be affected by grazing.

Grasslands and Shrub-Steppe

Many species of wildlife depend upon, or use only infrequently, grassland and shrubland habitats. Some migratory songbird species respond negatively to grazing, some positively, and many not at all. Grasslands

and upland shrublands are in good condition under current management. Deferment and rotation of livestock grazing provides a mosaic of vegetative patterns across the landscape throughout the summer. Turn-on dates are late enough to allow most ground nesting birds to produce a clutch prior to livestock use. During those years when livestock turn-on may be earlier to obtain utilization of introduced invasive grass species when range readiness allows, there would be many areas of the allotment free of livestock use. Utilization levels would provide for retention of litter for over wintering birds needing forage and cover.

Conifer Forest

Coniferous habitat is not limiting and livestock use of this type is less frequent. Most interior forest habitats are little affected by livestock. Ground cover throughout most forested stands does not provide adequate or palatable forage for livestock. More open or ecotonal-forested areas receive more use by livestock for forage, shade, and bedding. There would be little, if any, change in conifer forest habitats with the implementation of any of the action alternatives.

Riparian Areas, Including Springs

Streamside habitats, wet meadows, seeps, and springs all attract wildlife and livestock. Riparian areas are used as foraging sites, nesting habitat, and cover. Optimal riparian dominated vegetation consists of native grass-like plants, grasses, forbs, and shrubs. The majority of the areas expressing riparian dominated vegetation are in good condition on the West Paradise Allotments due to inaccessibility to livestock, appropriate livestock stocking levels, and adequate grazing recovery periods. Riparian vegetation is impacted in small patches around water developments where livestock have access. Impacts at these sites include introduction of non-native species, bare ground, reduced vigor of shrubs, decreased structural diversity, and altered vegetation composition.

The majority of riparian habitats on the West Paradise Allotments are only lightly impacted by cattle. These include: Rock Creek (south) and its tributaries, Eightmile Creek, North Dry Creek, and West Pine Creek. These areas exhibit a high similarity to the potential natural community. They are either inaccessible to livestock, produce forage that is not suitable for livestock, or are grazed only in passing and not used for extensive periods for loafing and shade.

There are some small areas in West Pine Creek where livestock concentration has caused trampling and browsing, retarding the development of healthy shrub communities. Unprotected seeps and spring sources associated with constructed water developments are also impacted

by livestock in this way. North Dry Creek has also been impacted by riparian logging and is susceptible to overgrazing by livestock due to its accessibility and productivity.

Different migratory bird species respond differently to livestock grazing impacts. The individual response is based on the type of habitat affected, the type of nest structure used by that species, and the type of foraging requirements. Some species respond negatively to grazing, some positively, while others show an inconsistent or weak response to grazing. Riparian areas are key habitats for migratory birds as more than half of western landbird species breed exclusively or primarily in deciduous vegetation associated with water. Migratory birds are especially vulnerable to degradation of riparian habitat due to its limited distribution and extent across the landscape. Migratory bird species that utilize vegetation communities degraded by grazing may experience fewer or lower quality nesting opportunities, less cover making them susceptible to predation, diminished feeding opportunities, and general disturbance.

Many of the species that respond negatively to grazing are also subject to nest parasitism. Migratory birds in riparian habitat are vulnerable to parasitism, which may be attributed to population declines in some species. Cowbirds are obligate brood parasites that use small, passerine, open-cup nesters as hosts. Cowbirds are closely associated with agricultural landscapes and the presence of livestock. There is a positive association with livestock presence, foraging opportunities for cowbirds, and their period of egg laying. Therefore, the risk of cowbird parasitism would be low when livestock are not turned on to the allotments until after July 1. Most birds would be done nesting or nesting would be far along enough that cowbirds would not parasitize nests.

Aspen

Aspen is considered a keystone species. Aspen, a deciduous tree, contributes to ecological diversity and supports a variety of plant associations. According to Campbell and Bartos (2001), Johnson (2005), and Kay (1997), aspen stands are, with the exception of riparian areas, considered the most biologically diverse ecosystem in the Intermountain West. As aspen dominated landscapes covert to other cover types, tremendous biodiversity is lost.

Aspen stands provide important forage, cover, shade, and nesting habitat for birds, small mammals, big game, and forest carnivores (DeByle 1985b, Johnson 2005). Aspen provides habitat for many species of birds, some of which utilize the stand year-round while others use aspen during only a portion of the year (DeByle 1985b). Birds breeding in aspen stands include shrub or tree canopy nesters, cavity nesters, or ground nesters. Aspen trees offer more structural diversity than conifer forests (Johnson

2005). Snags provide perches for birds of prey and sites for cavity nesters. Bird communities vary with the size, age, and grazing history of aspen clones (Kay 1997).

Both livestock and native herbivores modify aspen habitats by grazing understory vegetation, browsing developing aspen sprouts, and making regular use of stands for bedding and summer thermal cover. Direct effects of grazing include removal of plant cover and alteration of the plant community. Browsing reduces aspen growth, vigor, and numbers and can drastically reduce or eliminate sprouts (DeByle 1985a). Domestic livestock browse the aspen with increasing pressure through summer and fall. This impact is greatest on shrubs and young trees less than approximately thirteen feet tall. Trampling that inevitably occurs with grazing and browsing damages vegetation, compresses litter cover on the soil surface, and compacts soil. The combined effect of grazing, browsing, and trampling may ultimately increase erosion and soil runoff.

Grazing within aspen stands can limit the optimal use to migratory birds. The effect of grazing in aspen stands on migratory birds and their habitat is similar to those incurred in riparian habitat. Ground nesting birds are very susceptible to habitat alteration and trampling by grazing animals (DeByle 1985b) as cover is reduced and predation increases. This may alter populations and relative species abundance (DeByle 1985a). Maintaining and restoring aspen is important because of its exceeding high biodiversity (Kay 1997). A decline in aspen on the landscape could lead to significant declines in nest success for birds (Struempf and others 2001).

Livestock grazing has affected both upland and riparian vegetation in localized areas throughout the allotment, but it is very unlikely that these effects have had measurable effects upon the diversity of wildlife due to their limited extent and magnitude. Nothing proposed in the action alternatives would be expected to alter conditions substantially enough to measurably affect wildlife diversity at the landscape scale.

The No Grazing Alternative and the Adaptive Management Alternative would not incur further impacts than those already occurring to some degree in the grassland/ shrubland, riparian, aspen, and conifer forest habitats. There were no key issues related to these habitats.

Direct/Indirect Effects

Livestock grazing could affect successional state of the vegetation, composition of plants in the area, structure of plants, and stability of the system. General potential effects of livestock grazing by alternative on migratory bird habitat are summarized in Dixon (unpublished paper) and are incorporated by reference here.

Alternative 1 - No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Under Alternative 1, there would be no livestock grazing on the West Paradise Allotments. The lack of livestock on the allotment would eliminate any human activity associated with permitted livestock grazing and habitat alteration from occurring. For the West Paradise Allotments, the riparian areas affected by livestock include short reaches of West Pine and Eightmile and spring development sources. Impacts from other activities would persist over time and could not be corrected with changes in livestock grazing practices. Those riparian reaches with physical site characteristics and plant communities that reflect generally low grazing disturbance regimes would maintain or improve their potential natural community, except where other activities have compromised riparian habitat (i.e. riparian harvest, road building). The plant communities would have fully developed structural layers made up of desired plant species. Canopy cover of desired native sedges, grasses and forbs would reflect potential. Introduced species may persist but at relatively low levels. Willows and other desired woody species would grow vigorous as demonstrated by their robust establishment and successful reproduction. Long term, dense shrub communities and subsequent extensive wet soils would discourage livestock impact.

The effects of removing livestock would be beneficial for those migratory bird species that rely on complex riparian vegetation such as Lazuli bunting, willow flycatcher, common yellowthroat, and some sparrow and warbler species. For these species, the increase in diversity and biomass of vegetation would increase niche space for nesting and cover. Other species that respond favorably to grazing (robin, pine siskin, bluebird) may shift habitat use or move to areas with livestock concentration. The risk of cowbird parasitism would decrease or be eliminated due to the absence of livestock. Some risk may still persist due to livestock grazing on adjacent private lands. By removing grazing on a landscape whose vegetation evolved with native herbivores, the no grazing scenario may be less beneficial to migratory birds than continuing some level of grazing at managed levels to maintain structural and plant species diversity without adverse impacts.

Alternative 2 – Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

With the continued implementation of current management, those riparian reaches that are currently at their potential natural community would most likely be maintained. Upland areas would be maintained. However, timothy grass may continue to compete with native perennials and remain in the areas where it is currently growing, if livestock do not utilize it when it is palatable.

Migratory birds would continue to be impacted as current livestock levels and management would continue as they are today. Those species dependent upon riparian areas would have slightly less habitat available to them at those areas identified as dissimilar from their potential natural community than either the No Action Alternative or the Adaptive Management Alternative. Other species would respond favorably to continued livestock grazing in riparian areas. The risk of cowbird parasitism would persist at current levels and may increase long-term.

Alternative 3 - Adaptive Management Alternative

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Riparian reaches with a high similarity to the potential natural community would be maintained. Those with a moderate similarity would move toward high similarity. This includes the sources to water developments. Once livestock is excluded, the springs will recover fully. Structural layers would increase. Desired plant species would increase in vigor and compete with undesirable non-native plant species. A full complement of desired plant species adapted to some level of grazing would occur long-term. Willow and other desirable shrubs would also increase in vigor as browsing and trampling is decreased.

If monitoring indicates that the enlarged exclosures are not enough to allow the spring sources to recover to their full extent, or livestock are consistently exceeding utilization levels, then alternative water sources would be constructed or the tank will be moved farther away from the source. This would provide for better livestock distribution and allow the areas to retain desired conditions. Spring sources at newly constructed water developments would also be protected to mitigate from additional livestock damage to these sensitive areas.

Migratory bird species that depend on riparian habitats, in whole or in part would benefit from the implementation of the adaptive management practices. Other species that prefer shorter vegetation and are tolerant of some level of grazing would continue to be present on the allotments. By improving degraded areas to provide better structural and plant species diversity, yet still allow some level of grazing, the Adaptive Management Alternative may be beneficial to a larger array of bird species.

With the option of early season grazing when range readiness conditions allow, there is the potential for livestock to be on the allotments during bird breeding and nesting periods. This may increase cowbird parasitism if cowbirds arrive on the allotments earlier in the bird breeding cycle. This would not occur every year, however, and would only occur within one area of each allotment, thus minimizing effects to nesting birds. In contrast, the removal of introduced non-native grasses such as Timothy grass may increase the cover and vigor of native

perennials, which in turn would provide additional niches for nesting and cover. The adaptive management alternative would have less negative effects to migratory songbirds and improve habitat more than current management.

Cumulative Effects

Cumulative effects assessment requires consideration of past, present and reasonably foreseeable events. Vegetation altering processes can have very long-lasting effects on wildlife habitat. Past impacts to wildlife habitat are reflected in the current baseline vegetation used for analysis. Past activities within the project area include historical livestock grazing for the last century. Open range laws and lack of fences undoubtedly led to heavy grazing throughout the area. Fire suppression, along with grazing, altered plant communities' biomass production, species composition, and diversity. Conifers have encroached into non-forested areas historically kept from climax conditions with frequent fire. Noxious weeds were introduced and infestation levels have increased in some areas. Past logging and road building have also contributed to altered habitats in some areas of the allotments. Wildlife management of big game populations by permit has evolved to present day permits, seasons, and protections.

Presently, these activities continue to this day on National Forest although livestock numbers are probably at their lowest. Some of the project area does not provide for public access and therefore limits administrative management as well. Logging, farming, ranching, and development continue on private lands. The Paradise Valley Fuels Management and Prescribed Burning project is currently being implemented. No adverse affects on wildlife species were anticipated. The majority of species will not be impacted or will benefit from this activity.

Activities on the National Forest that may occur in the future are additional aspen treatment, fuel reduction projects (especially adjacent to private lands), and increased levels of recreation. Any future federal actions in the project area that are not being considered at this time, will undergo a separate analysis, based in part on an understanding of the consequences to wildlife habitat incurred by the currently proposed project.

Reasonably foreseeable actions that may occur within the project area on private lands include increased subdivision, private land development, and subsequent loss of habitat for migratory birds and other wildlife species. Private lands will continue to harvest timber, build roads, and conduct agricultural activities such as farming and ranching. Grazing by wild ungulates will continue as will the hunting seasons managed by the State of Montana Department of Fish, Wildlife, and Parks.

Alternative 1 – No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

With the implementation of Alternative 1, all of the allotments would be closed to livestock grazing. Cattle would be phased out over a two year period and grazing permits would not be re-issued for any of the allotments. By removing livestock from the allotments, there would be no negative direct or indirect effects to wildlife from grazing, thus there would be no cumulative effects.

Alternative 2 & 3 – Action Alternatives

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

The combined effects of the past, present, and reasonably foreseeable activities in the project area on wildlife include changes in plant communities related to grazing and fire suppression over the last century, removal of vegetation by grazing in riparian and upland habitat on an annual basis, short-term loss of ground nesting habitat due to planned prescribed burns and grazing with long-term benefits to forage palatability, production, and habitat diversity. Livestock grazing with the action alternatives (Alternatives 2 & 3) would not cumulatively add to any impacts to wildlife habitat that have not already occurred under current management. None of the alternatives would result in adverse cumulative effects on wildlife species. The adaptive management alternative would actually help to maintain or benefit riparian and aspen habitat.

F. Soils

Resource Issue F pertains to the effects that alternatives associated with this proposal would have on soils within the West Paradise Allotments.

Scale of Analysis

Temporal Bounds: The temporal bounds of this analysis are defined by the likely period of time for soil productivity recovery. Most mountain soils have formed in environments significantly different than the present over 1000's of years. Recovery is unlikely in 100 years for soils in these kind of climatic environments. Though the actual recovery period may be longer, only the period of 100 years is documented so is used as the temporal bound.

Spatial Bounds: The individual allotment maps in the EA are sufficient for the spatial bounds of this analysis. The only potential for soil disturbance would be within the allotment boundaries. For soils, the West Paradise analysis area is a total of 18,161 acres. This is broken into four allotments. Individual allotment

areas may vary from other estimates because of inclusions of private land and variation in measurement methods

Affected Environment

Soils were investigated using the Gallatin National Forest Soil Survey (Davis and Shovic, 1996), using map sheets 75A and 82. This was supplemented by general field experience in the areas. The term "steeply sloping" or "steep" means slopes average over 40%.

Bald Knob Allotment

On the Forest Service portion of the Bald Knob Allotment, soils have formed in material weathered from sedimentary sandstones and shales, generally in old, glacial-aged landslides. The sandstone/shale soils are moderately productive, and support subalpine fir forest with some meadows, with low potential forage production. Wet areas are common. See the Project File for a complete description of soil types found within the allotment. Soil types in the Forest Service are primarily 71-1A. Slopes are moderate and rolling.

Soils are compactable when wet on all areas. There are some perennial wet areas in the National Forest portion of the allotment. Forested lands have little potential for transitional range.

West Pine Allotment

Soils in the West Pine Allotment have formed in material weathered from volcanic rocks, generally on steep slopes. The volcanic soils are highly productive, and support grassland or transitional grassland/Douglas fir vegetation types. See the Project File for a complete description of soil types that occur within the allotment. True grasslands make up only part of the area, but are supplemented by open, transitional areas.

Soils are compactable when wet on all rolling grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Limitations are slope and soil use when wet.

Eightmile Allotment

Soils in the Eightmile Allotment have formed in material weathered from volcanic rocks, generally on steep slopes. The volcanic soils are highly productive, and support transitional grassland/Douglas fir vegetation types. See the Project File for a complete description of soil types that occur within the allotment. True grasslands make up a part of the area, and are supplemented by open, transitional areas.

Soils are compactable when wet on all rolling and steep grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Limitations are slope and soil use when wet.

Rock Creek South Allotment

Soils in the Rock Creek South Allotment have formed in material weathered from volcanic rocks, generally on steep slopes. The volcanic soils are highly productive, and support grassland or transitional grassland/Douglas fir vegetation types. See the Project File for a complete description of soil types that occur within the allotment. True grasslands make up a large part of the area, and are supplemented by open, transitional areas.

Soils are compactable when wet on all rolling grassland/Douglas fir areas, but there are few perennial wet areas in the allotment. Limitations are slope and soil use when wet.

Direct/Indirect Effects

All of the allotments described above contain soils with moderate to high productivity and appear suitable for grazing. All of the allotments have low potential for soil erosion and/or compaction in grazed areas. None of these allotments have a high potential for grazing throughout the total area. Most of the larger existing grasslands are on steep slopes. Existing soil mitigation are adequate to protect soils from use when wet.

Alternative 1-No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Alternative 1 (No Grazing) would not affect soils in any detrimental fashion. Closing the allotments would likely benefit soils by reducing compaction and reducing the spread of invasive species.

Alternative 2-Current Management

Bald Knob Allotment

The National Forest portion of the Bald Knob Allotment is mostly forested and has low potential for forage production. Therefore, there will probably be low cattle use on this portion. The July 1 on-date should adequately protect soils. If earlier dates are recommended, monitoring of soil conditions would be needed to prevent excessive soil damage.

West Pine Allotment

The West Pine Allotment has a moderate potential for forage production. Because there are few perennial wet areas, the July 1 on-date should adequately protect soils. If earlier dates are recommended, monitoring of soil conditions should occur to prevent excessive soil damage.

Eight Mile Allotment

The Eightmile Allotment has a moderate potential for forage production. Because there are few perennial wet areas, the July 1 on-date should adequately protect soils. If earlier dates are recommended, monitoring of soil conditions should occur to prevent excessive soil damage.

Rock Creek South Allotment

This allotment has a moderate potential for production. Because it will be closed there will be no soils impacts from cattle grazing.

Alternative 3-Adaptive Management

Bald Knob, West Pine, & Eight Mile Allotments

The Adaptive Management Alternative would continue livestock grazing on three of four allotments. With the existing mitigations of restricted access when soils are wet and the low sensitivity of these areas, there should be no significant impacts on soils, especially since vegetation quality (an indicator of soil quality) is so carefully monitored in the plan. Soil monitoring should be implemented to determine if adjustments in on-dates are needed. All allotments have similar effects, except for Eight Mile. The adaptive management alternative includes a potential earlier on-date. Soil monitoring would be required to assure continued soil protection.

Rock Creek South Allotment

Closing of the Rock Creek South allotment will benefit soils by reducing soil compaction and spread of weeds.

Cumulative Effects

Past, present and reasonably foreseeable actions include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands.

All Alternatives

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

There are no planned future activities associated with any of the allotments or alternatives that are anticipated to have any significant effects on soils. For these reasons, none of the alternatives are likely to have cumulative effects regarding soils and soils issues can be dismissed. Existing soil mitigation is adequate to protect soils from use when wet.

Because none of the alternatives are likely to have significant direct, indirect, or cumulative effects regarding soils, this resource issue can be dismissed. Existing soil mitigation are adequate to protect soils from use when wet.

G. Recreation

Resource Issue G pertains to the effects that alternatives associated with this proposal would have on recreational opportunities in the West Paradise Allotment analysis area. The West Paradise Allotments are located along the east side of the Gallatin Range. The area is characterized by intermingled public and private land and few public accesses. The Bald Knob allotment is completely surrounded by private land and lacks public access. The West Pine, Eightmile and Rock Creek South Allotments include public and private lands. Public access via roads and/or trails is available in all three of these allotments. The road network in West Pine Creek and Eightmile allotments is popular with motorized users and those looking for dispersed campsites. The trails in these allotments are non-motorized trails and are predominately used by hikers and stock users during the fall hunting seasons.

Scale of Analysis

Temporal Bounds: The timeframe considered for the effects analysis is 1980 to 2013. The 1980's began the majority of timber harvest projects which dominate the landscapes in the West Pine allotment and the portions of the Eightmile Allotment as well as neighboring private lands to all four allotments. The timber harvests helped form the recreational access that developed along roads built during this period. It is difficult to predict future changes beyond the next five years thus 2013 was selected as the future boundary of this analysis.

Spatial Bounds: Since effects to recreation relate to specific recreation facilities and opportunities on the ground analysis was bound by the project area.

Affected Environment

The Gallatin National Forest Plan directs the Forest to provide for a broad spectrum of recreation opportunities in a variety of Forest settings (FP, pg. II-1). The Gallatin National Forest Travel Plan (December 2006) contains language updating and further defining the forest-wide goals, objectives and standards for recreation. The Travel Plan recognizes the goal of "providing for a variety of recreation opportunities on the road and trail system that allows for the enjoyment of the Forest's backcountry, wilderness, rivers, lakes, topography, wildlife, snow and historical assets" (TP, Detailed Description of the Decision, I-1). Goals, objectives and standards are further defined in the Travel Plan by Travel Planning Area. The Yellowstone Travel Planning Area includes the West Pine Creek Allotment and the eastern portions of the Eightmile Allotment. The goals for summer recreation use include:

> *"to provide opportunities for non-motorized summer recreation use with an emphasis on hiking, mountain biking and horseback riding."*

The Tom Miner–Rock Creek Travel Planning Area includes the eastern portions of the Rock Creek South Allotment. The goals for summer recreation use for this travel planning area include:

> *"to provide low-level opportunities for both motorized and non-motorized summer recreation use with an emphasis on hiking, horseback riding, pleasure driving and motorcycle use."*

The Gallatin Crest Travel Planning Area includes the higher elevation western portions of the Eightmile Allotment and the Rock Creek South Allotment. The goals for summer recreation use for this travel planning area include:

> *"to provide opportunities for both motorcycle and non-motorized summer recreation use with an emphasis on hiking, biking, and horseback riding."*

Objectives for all three travel planning areas include achieving the goals stated above through the route-by-route-decisions made through the travel Plan. Future proposed changes to the uses specified in the Travel Plan will be done in consideration of the targeted recreation setting to be provided (TP, Detailed Description of the Decision, II-164). The targeted recreation setting for summer recreation in these allotments is a combination of Roaded Natural, Semi-Primitive Motorized and Semi-Primitive Non-Motorized.

> ***Roaded Natural*** settings are generally characterized as mostly natural-appearing environments with moderate evidence of the sights and sounds of man. Resource modification and utilization practices are evident but harmonize with the natural environment.

Motorized Semi-Primitive settings are predominately natural-appearing environments where there is often evidence of other users and moderate probability of solitude. Vegetation alterations are very small in size and number and are widely dispersed and visually subordinate.

Non-Motorized Semi-Primitive settings are similar settings to motorized semi-primitive area with the absence of motorized vehicles. In non-motorized setting , the presence of roads is tolerated, provided they are closed to public use.

Bald Knob Allotment

There are no recreational facilities (trails, roads, cabins, etc.) within the Bald Knob Allotment.

West Pine Allotment

The West Pine Creek Road #978, North Fork of West Pine Creek Road #981 and the South Fork of West Pine Creek Road #976 are all within the West Pine Allotment. Several dispersed camping sites exist along West Pine Creek Road #978. The North Fork of West Pine Creek Road #981 is gated year long to public motorized access and recreational use is limited to hikers, hunters and cross country skiers. The South Fork of West Pine Creek Road #976 leads to the West Pine Creek Trailhead and the West Pine Creek Trail #139. These roads are most heavily used during fall hunting by both day use and overnight camping hunters.

This allotment includes approximately the first two miles of the West Pine Creek Trail #139 and includes a gate at the allotment boundary fence where the trail leaves the allotment. The trail is used by hikers, horsemen and mountain bikers in the summer and hunters during the fall hunting season. There have been no problems with the gate being left open by recreationists.

Eightmile Allotment

This allotment includes one open road, North Dry Creek #2613. The North Dry Creek Road, within the allotment, is open to high clearance vehicles, ATVs and motorcycles from June 15 until September 5 each year as per the Gallatin National Forest Travel Plan of December 2006. The implementation of the Travel Plan is not yet complete and currently the road is still closed to motorized uses within the allotment boundary. Before the road will be opened to motorized uses a parking facility needs to be built in Section 30 and route marking signs need to be installed along the road in the Section 19 which is private land. The parking facility will include fencing, a cattle guard, and go-

by gate. A cattle guard will also be installed where Road #2613 enters Section 19 on its northern boundary if necessary.

The Eightmile Allotment also includes portions of the following trails: West Pine Creek Trail #139, North Dry Creek Trail #135 and Eightmile Trail #132. These trails are popular with hunters during the fall hunting seasons. Hikers, mountain bikers and horsemen use all three trails during the summer months. All three trails are open to non-motorized uses only.

Rock Creek South Allotment

This allotment includes the Donahue Road, Donahue Trailhead and Donahue Trail #183. The trail is a non-motorized trail popular with fall hunters. The trail also is used by hikers, stock users, mountain bikers, and cross-country skiers.

Recreation Special Uses (All Allotments)

The Bald Knob and West Paradise Allotments have no recreation special use permits.

The Eightmile Allotment has one hunting overnight outfitter who utilizes a camp on the North Dry Creek Ridge, south of trail #135. His operating period is during fall archery and general elk seasons.

The Rock Creek South Allotment has one hunting overnight outfitter whose hunting area overlaps with the National Forest lands in the allotment. His camp is located outside the allotment at the head of Fisher Creek.

Direct/Indirect Effects

Alternative 1–No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

The removal of livestock grazing from these allotments would have no negative effects on the recreational uses and facilities in these allotments.

Alternative 2–Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

The current livestock grazing practices on the Bald Knob, West Pine, Eightmile and Rock Creek South Allotments have had no negative effects on recreational uses and facilities.

No Concerns have been raised relative to recreational users impacting livestock grazing such as moving or disturbing cattle.

Alternative 3 – Adaptive Management

Bald Knob, West Pine, & Eightmile Allotments

The Bald Knob, West Pine, & Eightmile Allotments would be managed with an Adaptive Management strategy. Actions common to all phases on these allotments include:

- The collection of utilization measurements in each pasture to determine when livestock are moved.
- Once utilization standards are met, then the livestock would be moved to another pasture, and other area of the pasture, or off the allotment.
- Utilize introduced invasive grass species (i.e. Timothy) and provide for maintenance of native perennial grass species by grazing as early as June 1st when range readiness conditions allow.
- Manage invasive weed sites by mapping and treating them according to the Final Noxious and Invasive Weed Treatment Project, Environmental Impact Statement (EIS) and Record of Decision (ROD) released in June 2005.
- Riparian vegetative utilization measurements and streambank stability standards for the allotment vary by stream and are discussed in detail in Chapter 3.

The above actions will in general have a beneficial effect on recreation facilities and the recreating public's enjoyment of these areas. Closely monitoring utilization standards and moving cattle when standards are met will help prevent cattle from lingering in certain areas impacting trails, roads or recreation facilities.

Grazing as early as June 1st in order to utilize invasive grass species (Timothy) could negatively effect the conditions of roads and trails. Moving of cattle along these roads and nearby trails when the road and trail surfaces are still wet could severely damage the roads or trails. Mitigation would prevent use of roads or trails if they were still wet and muddy.

The management of weed sites will improve the naturalness of recreation sites. The recreating public will experience a more natural appearing setting for their activities.

Bald Knob Allotment

Phase 1 of the adaptive management alternative would promote increased management of the distribution of cattle in the allotment. The use of mineral supplements would assist in moving cattle to desired locations within the allotment. Since there are no recreation facilities within the Bald Knob allotment there would be no effects to recreation from this proposal.

West Pine Allotment

Phase 1 of the adaptive management alternative would promote increased management of the distribution of cattle in the allotment. The use of mineral supplements would assist in moving cattle to desired locations within the allotment. Locations for the mineral supplements should be carefully selected to avoid placement close to trails, roads or camp sites such that cattle do not congregate at these recreation sites and negatively impact road or trail conditions or affect the experience of the recreating public.

Phase 1 would also include exploring opportunities and locations for new water developments. These developments should be located at least 300 feet from roads and trails and ¼ mile from rental cabins or campgrounds so that the site does not draw cattle into areas used by the public.

Lastly phase 1 would consider excluding a small pond in Chimney Rock pasture by installing jack and rail fence. The public could still have access to the pond and thus the fence would not affect recreational opportunities.

Phase 2 would develop additional water sources for better distribution of cattle if needed. Again these developments should be located at least 300 feet from roads and trails and ¼ mile from rental cabins or campgrounds so that the site does not draw cattle into areas used by the public.

Eightmile Allotment

Phase 1 of the adaptive management alternative would promote increased management of the distribution of cattle in the allotment. The use of mineral supplements would assist in moving cattle to desired locations within the allotment. This practice would help prevent cattle from lingering in certain areas impacting trails, roads or recreation facilities such as cabin sites. Locations for the mineral supplements should be carefully selected to avoid placement close to trails, roads or trailheads such that cattle do not congregate at these recreation sites and negatively impact road or trail conditions or effect the experience of the recreating public.

Native shrubs and/or trees would be planted along sensitive riparian areas in Dry Creek. Plantings would enhance the stream corridor visually and generally improve the recreational experience.

Phase 1 would also include exploring opportunities and locations for new water developments. These developments should be located at least 300 feet from roads and trails and ¼ mile from rental cabins or campgrounds so that the site does not draw cattle into areas used by the public.

Phase 2 would additional water sources for better distribution of cattle if needed. Again these developments should be located at least 300 feet from roads and trails and ¼ mile from rental cabins or campgrounds so that the site does not draw cattle into areas used by the public. Any changes in fence configurations to protect riparian areas near new water developments should not block trails or roads and include appropriate gates if necessary.

Phase 2 also proposes to fence riparian tree/shrub plantings along Dry Creek. These fences should be constructed such that they do not block trails or roads and include appropriate gates if necessary.

Rock Creek South Allotment

With implementation of Alternative 3 the Rock Creek South Allotment would be recommended for closure. This closure would not adversely impact recreational opportunities in the area.

Cumulative Effects

Past, present and reasonably foreseeable actions include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands.

All Alternatives

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Because none of the proposed alternatives, with mitigation, will have direct or indirect effects on recreation there would be no cumulative effects from these livestock grazing proposals and the above past, present and reasonably foreseeable actions and this issue can be dismissed.

H. Roadless/Wilderness Study Area

Resource Issue H pertains to the effects that alternatives associated with this proposal would have on roadless and/or Wilderness Study Area (WSA) character within the West Paradise Allotments. An inventory of roadless lands has been maintained on the Forest since the early 1970's. The current inventory was displayed most recently in the Roadless Final Rule (36 CFR 294, USDA 2001) and may also be found in Appendix C of the Gallatin Forest Plan EIS (USDA 1987). The Montana Wilderness Study Act of 1977 created eight Wilderness Study Areas in Montana including the Gallatin Roadless area referred to as the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area (HPBH). During the early 1980's the Forest Service studied the suitability of the area for inclusion in the Wilderness preservation system. It was recommended that this study area not be designated Wilderness at that time due to thee checkerboard ownership pattern. Since then, nearly 37,000 acres of private land have been acquired within the HPBH boundary.

Scale of Analysis

Temporal Bounds: Direct, indirect, and cumulative effects were analyzed using temporal and spatial bounds. The temporal bounds considered for effects analysis was 1977 to 2013. In 1977 the roadless areas in the Gallatin Range were included in the Montana Wilderness Study Act; creating a Wilderness Study Area which includes portions of the S. Rock Creek allotment and the Eightmile Allotment. This designation affected the management of these areas. It is difficult to predict future changes beyond the next five years thus 2013 was selected as the future boundary of this analysis.

Spatial Bounds: Because effects to roadless and wilderness study areas are specific to the geographic area they occupy, the spatial bounds used for the analysis were the wilderness study areas within the South Rock Creek and Eightmile Allotments.

Affected Environment

Portions of the Eightmile and Rock Creek South Allotments are within the Hyalite-Porcupine-Buffalo Horn Wilderness Study. These areas were analyzed to determine the effects that any of the alternatives associated with this proposal would have that could substantially alter the Wilderness characteristics of these areas so as to render them unsuitable for future designation as wilderness. Wilderness qualities and characteristics to be evaluated under this mandate include:

Remoteness: Remoteness is a perceived condition of being secluded, inaccessible, and out of the way. Physical factors that can create a "remote" setting include topography, vegetative screening, difficulty of travel, and

distance from human impacts such as roads and structures. A user's sense of remoteness in an area is also influenced by the presence of roads, their condition, and whether they are open to motorized vehicles.

Solitude: Solitude is a personal, subjective value defined as isolation from the sights, sounds, and presence of others and human development. Common indicators of solitude are the number of individuals or parties one may expect to encounter in an area during the day, or the number of parties camped within sight and sound of other visitors. Solitude is directly related to remoteness of an area and primitive, unconfined recreational opportunities.

Natural Integrity*:* Natural integrity of an area is related to its physical setting and the extent to which long-term ecological processes are intact and operating. Impacts to natural integrity are measured by the presence and magnitude of human-induced change to the area. Possible impacts include phyiscal developments (e.g. roads, utility rights-of-way, fences, lookouts, cabins), recreation developments, domestic livestock grazing, mineral developments, wildlife and fisheries management activities, vegetative manipulation, and fire suppression activities.

Apparent Naturalness: The apparent naturalness of an area means the environment looks natural to most people using the area. It is a measure of importance of visitors' perceptions of human impacts to the area.

Special Features: Special features are those unique geological, biological, ecological, cultural, or scenic features that may be located in the roadless portion of the project area.

Manageability of Boundaries: This relates to the ability of the Forest Service to manage an area to meet the size criteria (minimum size requirement of 5,000 acres for wilderness) and the five elements discussed above.

Bald Knob Allotment

There are no designated roadless areas or Wilderness study areas within the Bald Knob Allotment.

West Pine Creek Allotment

There are no designated roadless areas or Wilderness study areas within the West Pine Allotment.

Eightmile Allotment

The Eightmile Allotment includes approximately 1890 acres of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area with in its boundary. Wilderness study area lands make up 31% of the total 6040 acres within the allotment (public and private land). Most of the roadless lands are in the higher elevations of the

allotment (See Map 4). Natural integrity of the WSA is already impacted in the Eightmile Allotment by a road built into a private section and extensive logging during the past 20 years on this private section of land within the allotment (Appendix C of the Gallatin Forest Plan EIS (USDA 1987) p.C-19). There are no additional designated roadless areas within the Eightmile Allotment. Livestock grazing has occurred on this allotment since the early 1900s and should be considered a well established use in this area.

Rock Creek South Allotment

The Rock Creek South Allotment includes approximately 3,000 acres of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area within its boundary. Wilderness study area lands make up 38% of the total 7950 acres within this allotment (public and private land). Most of the designated roadless lands are in the higher elevations of the allotment (See Map 5). The Gallatin Roadless Area/Hyalite-Porcupine-Buffalo Horn Wilderness Study Area as a whole exhibits high Wilderness Character (Appendix C of the Gallatin Forest Plan EIS (USDA 1987) pp. C-19). Livestock grazing has occurred on this allotment since the early 1900s and should be considered as a well established use in this area.

Direct/Indirect Effects

Alternative 1–No Grazing

Bald Knob & West Pine Allotments

There are no portions of the HPBH Wilderness Study Area or any designated roadless areas within either of the Bald Knob or West Pine Allotments so there would be no direct or indirect effects associated with the implementation of Alternative 1 (No Grazing).

Eight Mile & Rock Creek South Allotments

The removal of livestock grazing from the Eightmile, and Rock Creek South Allotments (Alternative 1) would have no negative effects on the wilderness character of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area or any designated roadless areas. Removal of livestock grazing could actually increase the natural integrity of the landscapes within the portions of the Eightmile and Rock Creek South Allotments that lie within the HPBH Wilderness Study Area.

Alternative 2 Current Management

Bald Knob & West Pine Allotments

There are no portions of the HPBH Wilderness Study Area or any designated roadless areas within the Bald Knob and West Pine Allotments so there would be no direct or indirect effects associated with implementation of Alternative 2 (Current Management).

Eightmile & Rock Creek South Allotments

Livestock grazing has occurred on the Eightmile and Rock Creek South landscapes for 100 years. Implementation of Alternative 2 (Current Management) would not change the numbers of cattle utilizing the Wilderness Study Area or increase the number of range improvements, such as fences and water developments, within the Wilderness Study Area or designated roadless areas within these allotments. Thus, current management (Alternative 2) would not decrease the wilderness character of these areas nor degrade the potential for future Wilderness designation or affect any designated roadless areas.

Alternative 3–Adaptive Management

Bald Knob & West Pine Allotments

There are no portions of the HPBH Wilderness Study Area or any designated roadless areas within the Bald Knob and West Pine Allotments so there would be no direct or indirect effects associated with implementation of Alternative 3 (Adaptive Management).

Eightmile Allotment

With implementation of Alternative 3, the Eightmile Allotment would be managed with an Adaptive Management strategy. Actions common to all phases of this strategy include:

- The collection of utilization measurements in each pasture to determine when livestock are moved.
- Once utilization standards are met, then the livestock would be moved to another pasture, and other area of the pasture, or off the allotment.
- Utilize introduced invasive grass species (i.e. Timothy) and provide for maintenance of native perennial grass species by grazing as early as June 1st when range readiness conditions allow.
- Manage invasive weed sites by mapping and treating them according to the Final Noxious and Invasive Weed Treatment Project,

Environmental Impact Statement (EIS) and Record of Decision (ROD) released in June 2005.

- Riparian vegetative utilization measurements and streambank stability standards for the allotment vary by stream and are discussed in detail in Chapter 3.

The above actions would in general have a beneficial effect on roadless areas. Closely monitoring utilization standards and moving cattle when standards are met would help prevent cattle from lingering in certain areas causing damage which would affect the naturalness of the Wilderness Study Area setting. Methods to help control non-native species such as timothy and invasive weeds could improve the naturalness of Wilderness Study areas.

Phase 1 of the adaptive management alternative would promote increased management of the distribution of cattle in the allotment. The use of mineral supplements would assist in moving cattle to desired locations within the allotment. These practices would help prevent cattle from lingering in certain areas impacting the naturalness of the roadless and non-roadless areas. Native shrubs and/or trees will be planted along sensitive riparian areas in Dry Creek. Plantings would be located outside the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area. Phase 1 would also include exploring opportunities and locations for new water developments. All new water developments would be located outside the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area.

Phase 2 would additional water sources for better distribution of cattle if needed. Again these developments should be located outside the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area. Phase 2 also proposes to fence riparian tree/shrub plantings along Dry Creek which are located outside the Wilderness Study Area.

Rock Creek South Allotment

With implementation of Alternative 3 (Adaptive Management), the Rock Creek South Allotment would be recommended for closure. Because portions of this allotment are in the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area, this closure would have a beneficial effect on the Wilderness Study Area by increasing the natural integrity of the landscape. There would be little effect to designated roadless areas because they mostly occur on steep, high elevation terrain that is rarely utilized by livestock.

Cumulative Effects

Past, present and reasonably foreseeable actions include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands.

All Alternatives

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

With the implementation of effective mitigation as described on (pp. 2-17 through 2-19), none of the proposed alternatives would have direct or indirect effects on the wilderness study area or designated roadless areas within the West Paradise Allotments. Thus, there would be no cumulative effects from these grazing proposals and the past, present and reasonably foreseeable actions listed above and this issue can be dismissed.

I. Heritage

Resource Issue I pertains to the effects that alternatives associated with this proposal would have on heritage values and cultural resources in the West Paradise Allotment analysis area. The West Paradise Allotments are located along the east side of the Gallatin Range.

Scale of Analysis

Temporal Bounds: Analysis of livestock grazing effects on heritage resources are confined to activities within the last century to the reasonably foreseeable future of approximately the next five years. Thus the temporal bounds considered are from 1900 to 2012.

Spatial Bounds: The area of analysis is limited to the boundary of the grazing allotments.

Affected Environment

The West Paradise Allotments are located along the east side of the Gallatin Range. The area has been subject to cultural use by hunter-gatherer populations from approximately 14,000 years ago up to about the 1870's. Historic use included early mineral exploration, tourism, grazing, and federal management. Seven prehistoric sites are known within the project area. There is also a historic trail partially within one of the allotments. The potential for additional sites

within the project area is low to moderate with much of the area characterized by slopes not conducive to high site densities.

Direct/Indirect Effects

Alternative 1–No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Cessation of grazing would have no adverse effects to heritage resources on any of the allotments.

Alternative 2–Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Site monitoring has determined the current management has had no impact on heritage resources and is not likely to have any future effects. Continuation of the current management would have no adverse effect on heritage resources in any of the allotments.

Alternative 3 – Adaptive Management

Bald Knob, West Pine, & Eightmile Allotments

Any future ground disturbing actions would have to be cleared with the Forest Archaeologist according to standard practice. This mitigation would be sufficient for no adverse effect to heritage resources with an adaptive management alternative.

Rock Creek Allotment

Cessation of grazing would have no adverse effects to heritage resources on the Rock Creek South Allotment.

Cumulative Effects

Past, present and reasonably foreseeable actions include recent wildfires, past road decommissioning, recent fisheries projects, past timber harvest, recreation access and facilities, travel plan implementation changes, the Bear Canyon Trail Creek land exchange, activities on private lands in the area, noxious weed treatments, future prescribed burning, and other foreseeable activities on national forest lands.

All Alternatives

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Because none of the proposed alternatives, with mitigation, will have direct or indirect effects on heritage resources, there would be no cumulative effects from these livestock grazing proposals and the above past, present and reasonably foreseeable actions and this issue can be dismissed.

J. Socio-Economics

Issue J pertains to the socio-economic effects of each of the proposed alternatives. Given the level of social and economic change in the region over the past decade, the residents of South-Central Montana have become increasingly aware of the effect National Forest resource management has on local and regional economies. Ranching operations and livestock grazing have historically played an important role in the communities and may impact local and regional economies, government receipts and expenses, and permittee income. This section presents concepts used to delineate an affected area and methods used to analyze the economic effects of the West Paradise Allotment project, including the project feasibility, financial efficiency and economic effects.

The preparation of NEPA documents is guided by CEQ regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires that consequences to the human environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed as related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis. If an agency prepares an economic efficiency analysis, than one must be prepared and displayed for all alternatives (40 CFR 1502.23). OMB circular A-94 promotes efficient resource use through well-informed decision-making by the Federal Government. It suggests agencies prepare an efficiency analysis as part of project decision-making. It prescribes present net value as the criterion for an efficiency analysis.

The development of range allotment management plans are guided by agency direction found in the Federal Land Policy and Management Act (FLPMA) of 1976 (Sec 103) which states: *Allotment management plans will include economic needs and objectives.* Range management direction is also found in Forest Service Manual (FSM) 2203 (1), (2), and (3), promoting cost-effectiveness in range vegetation management and direction for operating the permit system to best serve the public's long-term economic and social needs.

Scale of Analysis

Temporal Bounds: Analyses of livestock grazing effects on socio-economics are confined to activities within the last century to the reasonably foreseeable future. Grazing has been authorized since the formation of the Gallatin Forest in the early 1900's and it continues to be an important part of the management of forest resources today. Grazing permittees are often issued one permit covering both private land and National Forest System (NFS) lands when a logical grazing area exists to promote efficient use of intermingled ownership. Unless otherwise specifically stated, the temporal bounds for this analysis is 20 years into the future. Cost analysis was run for a ten year period (2009-2018).

Spatial Bounds: The analysis area includes four range allotments (Bald Knob, West Pine, Eightmile, & Rock Creek South) located in Park County, Montana. Analysis of effects to counties is limited to Park County, which maintains a population of about 16,000 people covering approximately 2,627 square miles. There are two incorporated cities, Livingston and Clyde Park, and several small communities. Livingston is the county seat, as well as the gateway to Yellowstone National Park.

Affected Environment

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

The affected area consists of the Bald Knob, West Pine, Eightmile and Rock Creek South Allotments that comprise approximately 18,978 acres of intermingled private and NFS lands. Approximately 3,592 of these acres are considered suitable for grazing. The livestock permitted in each allotment are cattle, primarily cow/calf pairs. On these allotments, approximately 646 cow/calf pairs may be permitted equaling an approximate total of 1893 head months (HM) of possible grazing use.

Analysis of effects on counties is limited to Park County, Montana, which has a diverse economy including everything from agriculture, logging, mining, and recreation to new technical businesses. Local residents pursue a wide variety of life-styles, but many share a common theme; an orientation to the outdoors and natural resources. These communities, closely tied to the National Forests in work, subsistence, and recreation, are directly affected by what happens on the National Forest lands.

The importance of the ranching sector is highlighted as both an economic benefit and a social benefit. It is a rich and important part of the history of the area. Ranching operations in the area often operate at a loss or close to the margin and their profitability can be notably affected by a variation of market conditions. If access to federal lands for grazing is altered significantly, this change would affect ranching profits and possibly overall business viability. The inventory of

all cattle in Park County 2007 was 42,000 with a total value of approximately 19.5 million (National Agricultural Statistics Service).

A comprehensive socio-economic analysis was completed during the development of the Gallatin Forest Plan in 1987. The analysis estimated the relationship of Forest activities to communities. Short-term impacts were given primary emphasis with lesser consideration given to long-term effects. Many projects over a large area were consolidated so that socio-economic effects could be shown effectively (Gallatin Forest Plan FEIS, pp. II-100). Although activities within the project area influence local socio-economic conditions, many of these influences and effects cannot be effectively analyzed at the project level. The comprehensive analysis conducted at the Forest Plan level can more readily project social effects to the local and regional communities.

Ranch operations in the West Paradise Allotment project area have built their operations with reliance upon Forest Service grazing permits. Private grazing is generally not available for replacement of federal permits, due in part to the high land values throughout Park County. Grazing fees are generally lower than market value. Although the Forest Service does not receive full market value, the permittees and local economy benefit from the value of grazing on NFS lands. This economic value is the basis for the Present Net Value calculations in the economic analysis. Grazing fees are set based on a formula established by Congress and Presidential Executive Order and are outside the scope of this analysis.

In 2007, the Forest Service collected a $1.35 per head month (HM) grazing fee from permittees for grazing cattle and horses. Of the grazing fees collected from permittees, 50% goes to the Federal Treasury. Funds appropriated by Congress are normally used to finance planning activities related to allotment management plans. All costs for normal maintenance of allotment improvements are paid by the permittees.

The other 50% is typically split between “Range Betterment Funds” to the Forest collecting the fees and the “25% Fund Payment to States”. Range Betterment Funds finance material and some labor for range improvement projects. Permittees contribute the labor for most projects. Each National Forest allocates Range Betterment Funds to individual Ranger Districts based on the priority rating for their range improvement projects. Twenty-five percent of the grazing revenues are returned to the states as payments to the counties with National Forest System lands within their boundaries for school and road funding. It is possible that 25% fund payments may effect “payments in lieu of taxes” to the counties.

Direct/Indirect Effects

The estimation of project feasibility and economic efficiency was based on the costs and revenues associated with all management, maintenance and administration of the allotments. Costs included in the analysis includes such items as construction and maintenance of fences, administration of the allotment by the Forest Service, the cost of materials for range improvements, noxious weed management, monitoring, etc. Benefits for permittees are based on the estimated value of red meat production attributable to the forage and associate improvements provided on the allotments. Benefits for the Forest Service are based on total revenues from grazing fees. Other costs and benefits, such as watershed and riparian health or scenic quality, have not been assigned dollar values; therefore, they are expressed using other quantitative and qualitative terms in the EA and project record.

The present net value (PNV) is one indicator for comparing the financial efficiency between alternatives. PNV is the difference between the present value of the revenues and present value of the costs. PNV converts costs and revenues over the entire time frame of the project into a single figure for a selected year. A positive PNV means that the project would generate more revenues than costs. The NEPA planning costs are sunk costs at the time of decision and are not include in the PNV analysis. The present net value is based benefits that will be produced during the life of the allotment management plan and costs including capital investments. The PNV was calculated using Quicksilver, a program for economic analysis of long-term, on-the-ground resource management projects and is displayed in Table 3-16. A four percent real discount rate (exclusive of inflation) will be used over the ten-year project lifespan (2009-2018). Details of the analysis are on file at the Livingston Ranger District.

Table 3-16 Efficiency Analysis (Present Net Value in 2007 dollars)

	Alternative 1 (2-year phase out)		Alternative 2		Alternative 3	
	Forest Service	**Permittee**	**Forest Service**	**Permittee**	**Forest Service**	**Permittee**
Benefits	$4,820	$84,840	$20,728	$364,844	$13,380	$235,492
Costs	$2,323	$10,153	$9,438	$47,845	$9,438	$43,661
Total PNV	**$2,497**	**$74,687**	**$11,289**	**$316,999**	**$3,942**	**$191,831**
Possible 25% Fund	$624.00		$2,822.00		$985.00	
AUM*	2499		2499		1613	
HM**	1893		1893		1222	

** AUM = Animal Unit Month. The AUM is the approximate amount of forage a 1000 lb cow will eat in one month. The AUM is 780 lbs of forage on a dry weight basis. An example is a cow/calf pair eats about 32% more of the forage one cow will eat in one month (1.32). This allows managers to match the number of animals with the amount of forage.*

*** HM = Head Months. The number of animals times the average number of days of authorized use.*

Alternative 1 – No Grazing

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Alternative 1 would reduce public land available for grazing by 3,592 acres. The No Grazing Alternative (Table 3-16) includes costs and revenues from the two year phase out period. Because no grazing would be occurring after this period, no monetary benefits would be gained by either the Forest Service or the permittees. With implementation of Alternative 1, permittees may elect to continue to graze on adjacent private land. The average cost of private pasture in the state of Montana was approximately $18.00 per AUM in 2006 (USDA Agriculture Survey Statistics). This would be a cost of approximately $44,982.00/year for the cattle currently permitted on the West Paradise grazing allotments. With the termination of grazing permits, the Forest Service would no longer have any management control over the private lands with the allotments. Additional costs may be incurred for removal of improvements by both the permittee and the FS. Over the long term, declining range conditions would likely result in reductions in forage availability, which would mean that other, more costly feed sources, would be required or herd sizes would be reduced.

On a region wide basis it is unlikely that any economic effects would be noticeable given the minor percentage of livestock feed resources derived from the allotments. From a social perspective, elimination of livestock grazing on NFS lands could be seen as a threat to the ranching culture of the region.

Alternatives 2: Current Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Under Alternative 2, permits for livestock grazing on the Bald Knob, West Pine, and Eightmile Allotments would be re-issued for the same numbers and season of use that are currently allowed. The Rock Creek South Allotment would remain vacant unless improvements (fencing) are completed by the perspective permittee.

Current management would provide $20,782.00 in revenue value over the ten year period. It will cost the Forest Service approximately $9,438.00 to administer and monitor the grazing permits. The present net value would be positive $11,289.00. Permittee costs and benefits are also shown here to disclose the possible economic implications of the alternatives on permittees. Alternative 2

would result in a positive benefit of $316,999.00 for the permittee (See Table 3-16). These figures are the present value of all accumulated costs and revenues over the ten-year planning period (present value of average annual costs are one tenth of these values). The Forest Service costs include all Forest overhead, planning, monitoring and administration costs incurred for the project area.

Alternative 2 has the highest total value for both the Forest Service and permittees. The difference between the two action alternatives is the number of cattle on the allotments. (Alternative 3 would maintain the level of administration and maintenance on the allotments but not receive the degree of grazing receipts).

Actual Forest Service revenues are based on congressionally established prices. These prices may be adjusted during the term of the permit. Historically, 25 percent of all grazing fees have been distributed to counties for school and road funding. It is possible that 25% fund payments may effect "payments in lieu of taxes" to the counties. Current Management would generate approximately $2,078.00 yearly in Forest Service revenues and $282.00 in 25% fund contributions yearly from the West Paradise range allotment grazing receipts. Over the ten-year period of the permits, the present net value of the Forest Service revenues for the 25% county fund would be $2,822.00. Alternative 2 would provide slightly higher payments assuming each allotment would be stocked to the highest limit set.

Alternative 3: Adaptive Management

Bald Knob, West Pine, Eightmile, & Rock Creek South Allotments

Alternative 3 would continue "permitted livestock grazing", utilizing management techniques designed to meet desired future conditions and ensure consistency with Forest Plan standards. This alternative focuses on Adaptive Management Strategies to improve resource conditions within these allotments.

Alternative 3 would re-authorize the grazing permits on Bald Knob, West Pine, and Eightmile Allotments. The Rock Creek South Allotment grazing permit would not be reissued and the allotment would be recommended for closure.

Alternative 3 would continue to provide $13,380.00 in revenue value. It would cost the Forest Service $9,438.00 to administer and monitor the grazing permits. The present net value would be positive $3,942.00. A positive benefit of $191,831.00 is also reflected for the permittees with Alternative 3 (Table 3-16).

Alternative 3 would generate $3,942.00 in actual Forest Service revenues and $394.00 in 25% fund contributions yearly. Over the ten-year period of the permits, the present net value of the Forest Service revenues for the 25% fund would be $985.00.

Cumulative Effects

This section considers the effects on the environment resulting from the incremental impact of the alternatives analyzed in detail, when added to other past, present, and reasonably foreseeable actions and trends. These effects are discussed by resource and collectively. Where no cumulative effects have been identified, such is noted.

Past and present actions include both human and natural disturbances that have had an effect on vegetative composition and structure. Human activities that have had the most influence on understory vegetation composition and structure in the analysis include the introduction of non-native species and livestock grazing. Other human activities including fire suppression and recreational uses have also impacted vegetation composition and structure. Natural disturbances include, but are not limited to, insect and disease outbreaks, wind events, fire, landslides, floods, and ice and "freeze-thaw" damage. Below are the main past and present actions considered in the cumulative effects analysis:

- Livestock Grazing
- Activities on Private lands in the area
- Recreational Access/facilities
- Travel Plan Implementation Changes
- Noxious Weed Treatments
- Prescribed Burning
- Land Exchanges

A land exchange in the Bear Canyon – Trail Creek area has been proposed and is presently ongoing. One parcel identified for exchange is located on NFS lands that are within the West Paradise Project allotments. This parcel is as follows:

T3S., R7E., Principal Meridian, Park County, Montana

- Parcel 2: Section 27: Lots 1-4, W½E½, N½NW¼, containing 438.28 acres, more or less.

Parcel 2 is within the Bald Knob Allotment. Trail Creek Ranch holds a term on-off grazing permit for this allotment. The permit authorizes the seasonal grazing of 10 cow/calf pairs of cattle from 7/01 to 9/30 annually.

When the exchange is complete, the permittee will have the option of either retaining grazing privileges on the involved Federal lands for a period of two years from the date of written notice, or waiving their privileges.

In the next twenty years, we anticipate the following occurring in the analysis area:

- Continued livestock grazing;
- Continued development on private land;
- Increased recreations use;
- Continued monitoring of the Travel Plan changes;
- Known noxious weed infestation area will continue to be treated and monitored;
- Prescribed fire application and/or hand thinning will be applied;

Bald Knob, West Pine, Eightmile, & Rock Creek South

Implementation of any of the alternatives considered in this Environmental Assessment would not be expected to contribute negatively or positively to these effects. The permittees in the West Paradise Allotment Project Area do not have Forest permits in other areas with recent NEPA decisions. Therefore, there are no known cumulative economic effects on individual permittees.

The livestock industry is expected to continue to play an important role in the local economy of Park County. There are no foreseeable changes in the Federal grazing fee structure in the near future. Current trends in Gallatin County (west of Park County) include a shift from agricultural to other industries as more diverse businesses become established. This may have an adverse affect on the livestock industry in Park County.

3.4 GALLATIN FOREST PLAN AND OTHER APPLICABLE LAWS, REGULATIONS, AND FOREST PLAN DIRECTION

Proposed grazing must be consistent with the National Environmental Policy Act of 1969 (NEPA), the Federal Land Policy and Management Act of 1976 (FLPMA), the Final Environmental Impact Statement and Land and Resource Management Plan (Forest Plan) for the Gallatin National Forest (Record of Decision signed 9/23/87) and the Multiple Use Sustained Yield Act of 1960 (16 USC528),. Adaptive Management (FSH 2209.13) guidelines have been incorporated in the development of Alternative 3. Several other laws, regulations, and guidelines also provided direction and guidance in association with development of the alternatives.

The Gallatin National Forest Land and Resource Management Plan (1987)

The Gallatin Forest Plan provides overall management direction in the form of objectives, guidelines and standards. The objectives for range resources include: Improved forage management will be used to maintain or enhance the range environment and to provide for increased animal unit months (AUMs); Development and use of available forage will depend upon the livestock industry's ability and desire to make the necessary investments and the Plan calls for continuing to administer about 15,000 AUMs of grazing use on private lands that are intermingled with National Forest lands within grazing allotments. Guidelines and standards from the Forest Plan (FP, p. II-20) include:

1. Allotment management plans will be completed on a scheduled priority basis.
2. Some allotments will be closed.
3. Vacant livestock allotments will be evaluated and allotment plans prepared prior to livestock use.
4. Domestic sheep will not be reintroduced to vacant allotments in grizzly bear MS-1 areas.
5. Structural and nonstructural improvements to increase forage production will be planned and scheduled through the allotment management process.
6. Livestock grazing in riparian areas will be controlled at levels of utilization listed in Management Area 7.
7. Allotments with continuous grazing during the growing period will be evaluated and alternative-grazing systems will be applied.

The Gallatin National Forest Plan provides broad direction for the management of forest fishery resources and more specific direction for management of sensitive species. Applicable forest wide goals (Forest Plan pp II-1, 2) include to meet or exceed State of Montana water quality standards and to maintain and/or enhance fish habitat to provide for an increased fish population. Objectives as outlined in (Forest Plan pp II-4,5) include that watersheds will be managed by application of "best management practices". Management standards have been set to mitigate impacts occurring to the fishery resource from land use activities. Livestock management will consider utilization levels in riparian zones. Applicable forest wide standards (Forest Plan pp. II-18,19,20,23) include:

1. Emphasis will be given to the management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas.
2. Habitat that is essential for species identified in the Sensitive Species list developed for the Northern Region will be managed to maintain these species. These species include: Trumpeter Swan, Westslope and Yellowstone Cutthroat trout, Western Big Eared Bat, Spotted Bat, Ferruginous Hawk, Harlequin Duck, Boreal Owl, and Common Loon.
3. The Forest will be managed to maintain and, where feasible, improve fish habitat capacity in order to achieve cooperative goals with the Montana

Department of Fish, Wildlife, and Parks and to comply with State water quality standards.

4. Livestock grazing in riparian areas will be controlled at levels of utilization listed in Management Area 7 (see FP page III-19).
5. Allotments with continuous grazing during the growing period will be evaluated and alternative grazing systems will be applied.
6. Best management practices will be used on all Forest watersheds in the planning and implementation of project activities (see FP Appendix C and planning records – "Watershed Management Guidelines for the Gallatin National Forest").

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.6 – Allotment management plans will coordinate livestock grazing use with big game habitat needs. No potential conflicts with big game have been identified in this project area on the West Paradise allotments.

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.8 – Emphasis will be given to the management of special and unique wildlife habitats such as wallows, licks, talus, cliffs, caves, and riparian areas. The adaptive management alternative identified practices to maintain or improve riparian or aspen habitats where they occurred. Currently, these habitats exhibit the desired future condition and are meeting these standards.

Forest Plan Standard for Wildlife and Fish, page II-18, section 6.a.12 – Habitat that is essential for species identified in the Sensitive species list developed for the Northern Region will be managed to maintain these species. Sensitive species were addressed as part of the analysis for livestock grazing on the West Paradise allotments. All of the species were dismissed or eliminated from detailed analysis.

Forest Plan Standard for Threatened and Endangered Species, page II-18, section 6.b.all. Threatened and endangered species were addressed as part of the analysis for livestock grazing on the West Paradise allotments.

The Gallatin National Forest Plan directs the Forest to provide for a broad spectrum of recreation opportunities in a variety of Forest settings (FP, pg. II-1). The Forest Plan recognizes objectives for recreation settings by incorporating the Recreation Opportunity Spectrum (ROS), which provides a framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities (FP, pg. II-2). Furthermore, the Plan specifically identifies as objectives activities that will be managed 1) to provide for users' safety, 2) that existing recreational hunting opportunities will be maintained, 3) that recreation trails will provide safe public access, and 4) to continue the cabin rental program (FP, pg. II-2-3).

Management Area Direction

The project area for livestock grazing is within six Forest Plan Management Areas. There is nothing in the action alternatives that is incompatible with wildlife direction for any of the management areas. Standards for Management Area 7 are the most applicable to issues related with livestock grazing (Forest Plan page III-19,20,21). The Forest Plan (MA7) requires the GNF to Riparian Area (Management Area 7) applicable goals and standards (Forest Plan page III-19, 20, 21)

1. Manage the riparian resource to protect the soil, water, vegetation, fish, and wildlife dependent upon it.
2. Maintain suitable habitats for those species of birds, mammals, and fish that totally or partially dependent upon riparian areas for their existence.
3. Range improvements such as fences and water structures may be constructed to help meet the forage utilization standards listed below (see FP page III-20).
4. Salting for livestock distribution will be outside of riparian areas.
5. Concentration of livestock will be kept at a level compatible with riparian zone-dependent resource needs through development of pasture systems and associated improvements.
6. Livestock utilization in riparian areas will follow these guidelines (see table in FP page III-20).
7. Manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows.

The Forest plan monitoring requirements (Table IV-1) monitoring item 5 lists two guidelines and standards which relate to limits of cumulative allowable management caused change to sediment filtration i.e. "more than a 25% loss in effective streambank cover" and stream channel stability i.e. a "20 point increase in stream channel score within 5 years due to management practices".

For the other management areas, no potential conflicts were identified in the project area. There is nothing in either of the action alternatives that is incompatible with the direction for any of the management areas.

Management Area 7 (MA7)-Riparian:

These standards would be met with the implementation of the required monitoring and other practices identified for riparian areas with the 2 action alternatives. These are riparian management areas (FP, p. III-19). These standards would be met as both of the action alternatives maintain suitable habitats for those species of wildlife totally or partially dependent on riparian areas.

Management Area 8 (MA8)-Timber Management: These areas consist of lands, which are suitable for timber management. This direction is not directly applicable to wildlife as no timber management is being proposed.

Management Area 10 (MA10)-Range/Timber: - These areas contain open grasslands, which provide forage for livestock interspersed with suitable timberlands. This direction is not directly applicable to wildlife as no timber management is being proposed.

Management Area 11 (MA11)-Forested Big Game Habitat: – These areas consist of forested big game habitat. They include productive forest lands that are available for timber harvest, provided that big game habitat objectives are met. For this management area with an emphasis on big game, no potential conflicts were identified in the West Paradise allotment project area.

Management Area 12 (MA12)-Wildlife/Dispersed Recreation – These areas provide important habitat for summer or winter wildlife use in a variety of terrain and vegetative They include productive forest lands that are available for timber harvest, provided that big game habitat objectives are met. For this management area with an emphasis on big game, no potential conflicts were identified in the West Paradise allotment project area.

Management Area 17 (MA17)-Range/Big Game:- These areas consist of grasslands or nonproductive forestlands on slopes less than 40 percent that are suitable for livestock grazing and contain important big game habitat. They contain some of the most productive and heavily used portions of range allotments. For this management area with an emphasis on big game, no potential conflicts were identified in the West Paradise allotment project area.

Gallatin Forest Travel Plan Direction

The Gallatin National Forest Travel Plan (December 2006) contains language updating and further defining the forest-wide goals, objectives and standards for recreation. The Travel Plan recognizes the goal of "providing for a variety of recreation opportunities on the road and trail system that allows for the enjoyment of the Forest's backcountry, wilderness, rivers, lakes, topography, wildlife, snow and historical assets" (TP, Detailed Description of the Decision, I-1).

Goals, objectives, and standards are further defined in the Travel Plan by Travel Planning Area. The Yellowstone Travel Planning Area includes the West Pine Creek Allotment and the eastern portions of the Eightmile Allotment. The Tom Miner/Rock Creek Travel Planning Area includes the eastern portions of the Rock Creek South Allotment. The Gallatin Crest Travel Planning Area includes the higher elevation western portions of the Eightmile Allotment and the Rock Creek South Allotment.

Standards and objectives for all three travel planning areas were considered and applied in the development of the alternatives.

Water quality and aquatic life standards for the GNF have recently been revised as part of the Travel plan EIS Record of Decision. These new standards complement Forest Plan direction, and provide more specific guidance. The new water, fisheries, and aquatic life standard are.

> **Standard M-1: Water, Fisheries, and Aquatic Life.** In watersheds with streams currently at or above fish habitat management objectives, proposals for road and trail construction, reconstruction and maintenance will be designed to not exceed annual sediment delivery levels in excess of those in Table 1. Sixth-code Hydrologic Unit Codes (HUCs) are the analysis unit for sediment delivery (and other habitat parameters). Within the analysis unit, sediment delivery values in Table 1 will serve as guidelines; however, sediment delivery values denoted in individual 7th code HUCs may temporarily exceed sediment delivery rates denoted in Table 4, in the following circumstances:
>
> 1. The HUC does not contain a fragmented sensitive or MIS fish population;
> 2. The majority of HUC's in the analysis unit remain within sediment delivery values listed in Table 1;
> 3. Other core stream habitat (e.g. pool frequency, pool quality) or biotic (e.g. macro-invertebrates, fish populations) parameters within the HUC do not indicate impairment as defined by Montana Department of Environmental Quality (MDEQ); and
> 4. Sediment delivery levels will return to values listed in Table 3-1 within 5 years of project completion.
>
> There are no applicable Travel Plan standards for wildlife. There are no new roads, reconditioned roads, or changes in the road and/or trail system proposed for this project. Open road densities would remain the same. From a wildlife perspective, the project would be consistent with our Travel Plan direction.

National Environmental Policy Act of 1969, as amended (NEPA)

The National Environmental Policy Act (NEPA) of 1969 requires an assessment of the impacts of human activities upon the environment. NEPA establishes the format and content requirements of environmental analysis and documentation. The entire process of preparing this EA was undertaken to comply with NEPA.

National Forest Management Act

The National Forest Management Act (NFMA) requires that Forest plans "preserve and enhance the diversity of plant and animal communities...so that it is at least as great as that which can be expected in the natural forest" (36 CFR 219.27). Furthermore, implementation regulations for the NFMA specify that, "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area".

There are currently 11 terrestrial species identified as "Sensitive" that are known or suspected to occur on the Gallatin National Forest (USDA 2004). With the implementation of the action alternatives, livestock grazing on the West Paradise allotments would have *"no impact"* on grizzly bear, bald eagle, gray wolf, peregrine falcon, trumpeter swan, harlequin duck, black-backed woodpecker, flammulated owl, goshawk, Townsend big-eared bat, and wolverine.

There are currently 3 fish species listed for the Gallatin National Forest, only one of which, the Yellowstone cutthroat trout, is native to the Yellowstone River drainage. For Alternatives 1, 2, & 3, grazing would have *no impact on the Yellowstone cutthroat trout.*

There are currently 2 sensitive amphibian species, the northern leopard frog and the boreal (Western) toad. No leopard frogs have been found in the Yellowstone River drainage or elsewhere throughout the project area, but additional surveys are necessary to validate their distributional range and presumed absence from the project area. Suitable habitat for leopard frogs exists throughout the project area.

Prior to 2007 surveys for this analysis, Western toads were not found on the east side of the Gallatin Range (Atkinson and Peterson 2000). Suitable habitat exists throughout the project area, but additional surveys are needed to validate their distributional range. A Western Toad was found in the low gradient reach of Eightmile Creek within the allotment near the forest boundary.

Under existing grazing management (Alternative 2), habitat degradation is not occurring in the lower reach of Eightmile Creek. There was little evidence of cattle use in that reach. Thus, grazing under Alternative 2 is having *no effect* on Western toads. For Alternatives 1 (no grazing) and 3 (adaptive management), riparian health is anticipated to remain in a healthy, functional condition. As such, it is reasonable to assume that habitat conditions for amphibians will remain suitable where they occur. Even though northern leopard frogs have not been found, habitat for both species would be suitable. Therefore, *no effect* is anticipated with these two alternatives for either species.

There will be "*no impact"* to sensitive plants within the treatment areas due to lack of potential suitable habitat or absence of plants based on completed surveys.

Adaptive Management (FSH 2209.13)

Adaptive management prescribes allowable limits for the timing, intensity, frequency, and duration of livestock grazing practices. These limits are represented as standards that are monitored to ensure that prescribed actions are being followed. Monitoring also determines if management changes are needed. Future administrative actions that adhere to the decision notice can be implemented without additional analysis.

Building adaptive management flexibility into allotment management allows for decisions that are responsive to needed adjustments in permitted actions. Historically, decisions have been narrowly focused, such as deciding to authorize the number, kind, or class of livestock with specific on-and off-dates under a certain type of grazing system. These kinds of decisions restrict management flexibility in meeting desired conditions and project objectives. Alternative 3 was designed to incorporate adaptive management strategies and techniques into the management of the West Paradise Allotments.

Endangered Species Act

Under Section 7 of the Endangered Species Act, each Federal agency must ensure that any action authorized, funded or carried out is not likely to jeopardize the continued existence of any threatened or endangered species. The action alternatives would have *"no effect"* on lynx. There are no plants listed as threatened or endangered in the project area. No concurrence is needed from the US Fish and Wildlife Service for "*no effect"* determinations.

Migratory Bird Treaty Act

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On January 10, 2001, President Clinton signed an Executive Order outlining responsibilities of federal agencies to protect migratory birds. On January 17, 2001, the USDA Forest Service and the USDI Fish and Wildlife Service signed a Memorandum of Understanding to complement the Executive Order. Upon review of the information regarding neotropical migratory birds in the wildlife report and project file, livestock grazing on the West Paradise allotments would not result in a loss of migratory bird habitat or be an extirpation threat to any migratory birds.

Standards for Management Area 7 are the most applicable to the two significant issues. The Forest plan (MA7) requires the GNF to "manage riparian vegetation, including overstory tree cover, to maintain streambank stability and promote filtering of overland flows". The Forest plan monitoring requirements (Table IV-1) monitoring item 5 lists two guidelines and standards which relate to limits of cumulative allowable management caused change to sediment filtration i.e. "more than a 25% loss in effective streambank cover" and stream channel stability i.e. a "20 point increase in stream channel score within 5 years due to management practices".

Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C 528)

The Multiple Use Sustained Yield Act of 1960 states "it is the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes". Alternative 1 (no action) would not provide for grazing opportunities on National Forest land. Alternative 2 (proposed action) and Alternative 3 (adaptive management) would provide for continued grazing opportunities and range improvement through adaptive management practices.

Clean Water Act of 1977

The objective of this act is to restore and maintain the integrity of the nation's waters. This objective translates into two fundamental goals: (1) eliminate the discharge of pollutants into the nation's waters; and (2) achieve water quality levels that are fishable and swimable. This act establishes a non-degradation policy for all federally proposed projects. Alternative 3 incorporates adaptive management in order to assure continued compliance with the Clean Water Act, which provides overall direction for protection of water from both point and non-point sources of water pollution. Alternative 2 (current management) and Alternative 1 (No Grazing) would also comply with this Act.

The State of Montana Water Quality Act (1969, 1975, 1993, 1996)

The State of Montana Water Quality Act requires the state to protect, maintain, and improve the quality of water for a variety of beneficial uses. Section 75-5-101, MCA established water quality standards based on beneficial uses. The Montana DEQ 303(d) list in the 2006 Montana Integrated Water Quality Report http://www.deq.state.us/CWAIC/default.aspx for the Paradise TMDL (Paradise Valley) planning area lists 3 streams on the 303(d) list including Bear Creek, Billman Creek, Six Mile Creek, as impaired segments in need of a TMDL. None of the stream segments in any of the West Paradise Allotments are included on the 2006 303(d) list. No TMDL's are required for any of the streams on the 2006 303(d) list.

The HUC6 watersheds within the West Paradise Allotments include Middle Trail Creek 100700020407, Eightmile Creek 100700020208, and Rock Creek 100700020201. R1R4 sediment modeling for the 2001 Fridley Fire estimated high potential sediment yield effects from the Fridley Fire in West Pine Creek and Eightmile Creek. The Gallatin NF Travel Plan and associated R1R4 analysis documented substantial sediment yield recovery in the 2 Travel Plan areas in the West Paradise Valley Allotments area including Tom Minor Rock and Yellowstone. Sediment levels in West Pine Creek are still elevated due to sediment deposition in the stream from the 2002 stormflow events and residual instability in some of the West Pine Creek tributaries from the Fridley Creek Fire. R1R4 sediment modeling analysis indicates that all drainages within the West Paradise Allotments are in compliance with the Gallatin NF sediment standards.

No areas within the allotments are currently known or suspected to have sufficient concentrations of livestock along or through streams to result in any type of water quality violations (Alternative 2). Water quality standard violations by livestock grazing in Montana are usually associated with feedlots or corrals where livestock are heavily concentrated near streams. These situations do not occur on the allotments. See pp 3-6 through 3-17 for a complete description of stream conditions.

Alternative 1 would comply with the Water Quality Act with the removal of cattle from the National Forest portion of the allotments. However, cattle could still graze on private land within the allotments where the Forest Service would no longer have administrative control. Alternative 3 would utilize adaptive management practices throughout the allotments (private and National Forest land) in order to maintain streambank stability, as well as improve overall riparian vegetative conditions.

Executive Order 12898 – Environmental Justice

Executive Order 12898 directs each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Where Forest Service proposals have the potential to disproportionately adversely affect minority or low-income populations, these effects must be considered and disclosed (and mitigated to the degree possible) through NEPA analysis and documentation.

None of the actions associated with any of the alternatives would adversely affect any disadvantaged or minority groups because of the project area's distance from large population centers and the diffuse level of adverse impacts on any social group. A project such as this would not produce hazardous waste or conditions that might affect human populations.

Federal Land Policy and Management Act (FLPMA) of 1976 (Sec 103)

FLPMA authorizes the Secretary of Agriculture to issue permits for various uses on National Forest System lands. An allotment management plan (AMP) is defined in The Federal Land Policy and Management Act as a document, prepared in consultation with lessees or permittees that applies to livestock operations on public lands, and (1) prescribes the manner in and extent to which livestock operations are to be conducted in order to meet multiple use, sustained-yield, economic, and other needs and objectives, (2) describes range improvements to be installed and maintained, and (3) contains such other provisions relating to livestock grazing and other objectives found to be consistent with provisions of FLPMA.

The Federal Land Policy Management Act as amended by the Public Rangelands Improvement Act allows for AMPs to be included in grazing permits (43 USC 1753[d], as amended by 92 Stat. 1803 [1978] and 36 CFR 222.1 and 222.2).

Alternative 2 (current management) and Alternative 3 (adaptive management) were developed to comply with FLPMA. Alternative 1 (no action) would discontinue the grazing permit on National Forest Lands within the allotments.

Federal Noxious Weed Act of 1974, as Amended

This act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Alternative 2 (current management) would not violate the Federal Noxious Weed Act, as populations of weeds are currently being treated as necessary as a part of the regular district noxious weed program. Implementation of Alternative 3 would likely reduce the rate of spread of invasive species within the allotments over time through the use of adaptive management and intensive monitoring procedures. See the Upland Vegetation discussion (pp. 3-35 through 3-44). Alternative 1 (no action) would also likely reduce the rate of spread of invasive species over time. Removal of livestock from the allotments would likely result in an increase of native vegetation and other herbaceous species, which provide competition for invasive species. However, with Alternative 1 (no grazing), the Forest Service would lose administrative authority over the private portions of some of the allotments, which could still be in use.

National Historic Preservation Act of 1966 (NHPA)

The Forest Service is mandated to comply with the National Historic Preservation Act (as amended 1993) [Public Law 89-665]. Section 106 of the NHPA requires that federal agencies with direct or indirect jurisdiction over undertakings afford the Advisory Council on Historic Preservation (ACHP) reasonable opportunity for comment on such undertakings that affect properties included in or eligible for inclusion to the National Register of Historic Places (NRHP) prior to the agency's approval of any such undertaking (36CFR800.1). Historic properties are identified by a heritage resource inventory and are determined as either eligible or not eligible properties for the National Register. Eligibility is reviewed, and concurrence given by the Montana Historic Preservation Office (MTSHPO). Sites that are determined eligible are then either protected in-place or adverse impacts must be mitigated. This process takes place prior to any decisions relative to the project. The Gallatin Forest Plan incorporates these requirements under the National Historic Preservation Act (1966). Forest Plan standards applicable to this project include inventory procedures, evaluation procedures, protection/preservation procedures, and coordination or consultation procedures (see FP II-14 and II-17).

Historic use included early mineral exploration, tourism, grazing, and federal management. There is also a historic trail partially within one of the allotments. The potential for additional sites within the project area is low to moderate with much of the area characterized by slopes not conducive to high site densities. Mitigation as outlined on pp. 2-18 will ensure protection of these historic sites.

American Indian Religious Freedom Act of 1994 (AIRFA), Native American Graves Protection Act of 1990 (NAGPRA)

The Gallatin Forest Plan incorporates the requirements under the following statutes: the National Historic Preservation Act (1966) and the American Indian Religious Freedom Act (1978). Forest Plan standards applicable to this project reflect the mandates under the above statues include inventory procedures, evaluation procedures, protection/preservation procedures, and coordination/consultation procedures (see FP II-14 and II-17). A scoping letter regarding the project was sent to the Crow Tribe. No comments were received from the tribe. The area has been subject to cultural use by hunter-gatherer populations from approximately 14,000 years ago up to about the 1870's. Seven prehistoric sites are known within the project area. All alternatives being considered for the West Paradise Allotments are consistent with the laws, regulations and Forest Plan direction discussed in this section.

Forest Service Manuals (FSM) 1970 & 2203

Economic and social analyses are described in Forest Service Manual (FSM) 1970. This guidance considers costs, benefits, and effects of proposed actions on the public. It also considers economic efficiency, along with other factors, in making decisions and in implementing and reviewing projects, programs and budgets. Forest Service Manual (FSM) 2203 (1), (2), and (3) outlines cost-effectiveness in range vegetation management and direction for operating the permit system to best serve the public's long-term economic and social needs. The economic analysis provided on pp. 3-96 through 3-103 was completed utilizing the guidance provided in these manuals.

Forest Service Handbook (FSH) 1909.17

Forest Service Handbook (FSH) 1909.17 – Economic and Social Analysis, Chapter 10, measures costs and outputs to consider for economic efficiency, ranking for alternatives. The direction provided in this handbook was used to complete the economic analysis for this project.

3.5 OTHER DISCLOSURES

Other disclosures and criteria to be considered in order to make a determination of whether the proposed actions are major federal actions that would significantly affect the quality of the human environment and require the preparation of an Environmental Impact Statement (EIS) include the following:

Effects on Threatened and Endangered Species

The only listed species, which may occur in the project area is the threatened Canada lynx, however, he majority of the vegetation on the West Paradise Allotments either do not provide lynx habitat or are not considered suitable for livestock. The action alternatives include utilization standards for uplands and riparian areas, as well as potential range improvement structures designed to maintain or improve rangelands through better livestock distribution. Where livestock grazing occurs within or near lynx habitat, these proposals will ensure regeneration of shrubs and trees where fire or logging has occurred, provide for aspen sprouting and survival sufficient to perpetuate long-term viability of the clones, maintain or achieve mid-seral or higher condition shrub-steppe to provide lynx habitat matrix, and maintain or achieve mid-seral or higher condition riparian areas or willow carrs to provide cover and forage for prey species. These conditions either currently exist or are not meeting these guidelines due to impacts from sources other than livestock grazing such as roads, past logging, or fire. Continued livestock grazing, or the removal of livestock, is not expected to create further impacts than what has already occurred over time.

Grizzly bears and bald eagles have been delisted and are now designated as sensitive species. The gray wolf is delisted as of March 28, 2008 and will also be designated as sensitive.

Unique Characteristics of the Geographic Area

The West Paradise Allotments do not contain any ecologically unique or critical areas. However, the geology and spectacular beauty of the area is thought by many people to be very special. The allotments are located on the west side of the Paradise Valley, approximately 15 - 40 miles south west of Livingston, Montana. To a traveler on US Highway 89 South, none of the allotments are highly visible. The West Paradise analysis area is moderately used for recreation, mainly by local residents.

Portions of the Eightmile Allotment and Rock Creek South Allotments are within the Hyalite-Porcupine-Buffalo Horn Wilderness Study. The Eightmile Allotment includes approximately 1890 acres of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area with in its boundary. Wilderness study area lands make up 31% of the total 6040 acres within the allotment (public and private land). Most of the roadless lands are in the higher elevations of the allotment. The Rock Creek South Allotment includes approximately 3,000 acres of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area with in its boundary. Wilderness study area lands make up 38% of the total 7950 acres within the allotment (public and private land). Most of the roadless lands are in the higher elevations of the allotment

Livestock have been a fixture on this landscape for 100 years. With Alternative 1, the removal of grazing from these allotments would have no negative effects on the

wilderness character of the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area. Removal of grazing could increase the natural integrity of some of these landscapes. Alternative 2 **(**current management) would not change the numbers of cattle using the Wilderness Study Area or increase the numbers of range improvements such as fences and water developments within the Wilderness Study, thus would not decrease the wilderness character of these areas nor degrade the potential for future Wilderness designation. With Alternative 3, the Rock Creek South Allotment would be recommended for closure. Since portions of this allotment are in the Hyalite-Porcupine-Buffalo Horn Wilderness Study Area, this closure would have a beneficial effect on the Wilderness Study Area by increasing the natural integrity of the landscape.

There are no Wild & Scenic Rivers or ecologically critical areas known to occur within the allotment boundaries.

Effects of the Alternatives on Prime Farmland, Rangeland, and Forest Land

There is no prime farmland, rangeland, or forestland located within the project area. There are approximately 18,978 acres of intermingle National Forest system and private lands within the allotment boundaries with 3,592 acres that are considered to be suitable rangeland. Grazing has been active on these allotments for many decades. Adaptive management actions would maintain and/or improve the suitable range conditions over time by adjusting the number of grazing livestock to fit the carrying capacity of the land. Implementation of the Adaptive Management Alternative (Alternative 3) would help to better distribute the livestock in order to maintain the native vegetative composition, lower the likelihood for new populations of invasive weeds, maitain and stabilize stream banks, and help to return the disturbed stream reaches to their proper functioning condition. The No Action Alternative (Alternative 1) may also somewhat improve suitable rangeland conditions over time by eliminating grazing, however, the Forest Service would lose administrative authority over the private portions of the allotments. The Current Management Alternative (Alternative 2)would not noticeably change rangeland conditions.

Effects of Alternatives on Floodplains and Wetlands

Floodplains and small wetland areas would likely be improved over current conditions (Alternative 2) by implementing the Adaptive Management Alternative (Alternative 3). Streams and wetland areas would be monitored on a regular basis. The opportunity to develop alternative watering sources would be assessed. Protective measures to be taken would be dependent on the results of monitoring, regarding whether an upward trend is occurring in restoring native vegetative composition, proper functioning condition of streams, stream bank stability, etc. Alternative 1 would eliminate grazing on the allotments so it would be expected that small wetland areas and floodplain conditions would improve over time.

Effects of Alternatives on Social Groups

Neither of the action alternatives would have discernible effects on minorities, American Indians, or women, or the civil rights of any United States citizen. They would not have a disproportionate adverse impact on minorities or low-income individuals.

The current management and adaptive management actions are intended to promote efficient use of intermingled ownership lands. The West Paradise Allotments are an integral part of the current permittees' livestock operations and discontinuing the grazing permits, Alternative 1 (no action) would have an economic effect to the permittees and possibly the local community (See Chapter 3, (pp. 3-96 through 3-103).

Effects on Public Health and Safety

There would be no significant effects on public health and safety with any of the alternatives. Portion of the allotments are adjacent to residences, however, recently there have been no major permittee/landowner conflicts.

Effects to Scientific, Cultural, or Historic Resources

All of the West Paradise Allotments were reviewed for effects to cultural and/or historic properties related to the re-issuance of grazing permits for these allotments. A scoping letter was sent to the Crow Tribe regarding the project. No comments were received from the tribe.
Seven prehistoric sites are known within the project area. There is also a historic trail partially within one of the allotments. The potential for additional sites within the project area is low to moderate with much of the area characterized by slopes not conducive to high site densities.

If there is any type of excavation within the National Forest portion of the allotments, such as constructing an alternative watering site, a heritage survey would be conducted prior to any ground disturbing activity. None of the alternatives being considered would be expected to have adverse effects to scientific, cultural, or historic resources.

Short-term Use versus Maintenance and Enhancement of Long-term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource. Implementation of adaptive management (Alternative 3) would improve both short-term and long-term productivity over current management (Alternative 2) by adjusting the number and providing for better distribution of permitted livestock to better fit the carrying capacity of the land. The project area has a history of extensive

grazing for many decades. There are mitigation and monitoring requirements associated with both current management (Alternative 2) and the Adaptive Management (Alternative 3) Alternatives. The Adaptive Management Alternative contains a stepped approach to corrective actions that would be taken depending on the results of the required monitoring. Important features associated with the adaptive management proposal include improvement of the proper functioning condition of streams, ensurance of streambank stability, reduction of invasive weed species, enhancement of the native vegetative composition, and enhancement of aspen regeneration within the allotment boundaries. . The purpose of adaptive management is to allow management the flexibility to be responsive to necessary adjustments in permitted actions. Alternative 1 would eliminate grazing on the allotments so there would be no short term use associated with the National Forest portions of the allotments.

Irreversible and Irretrievable Commitment of Resources

An *irreversible* commitment of resources refers to the use or commitment of a resource that is incapable of being reversed or changed. For example, nonrenewable resources, such as minerals in the ore, would be removed forever during the milling of the ore and would be irreversibly lost or committed. Irretrievable commitment of resources refers to actions that result in changes to resources that cannot be recovered or regained. None of the alternatives would cause irreversible or irretrievable commitment of resources. The allotments have grazing histories that have occurred for many decades.

Currently (Alternative 2) some areas within the allotments have other non-native vegetative species out-competing the native vegetation. Some stream reaches are not operating within their desired future condition. Objectives of the Adaptive Management Alternative (Alternative 3), to be met through monitoring and corrective action, are:

- Continue to promote the efficient use of intermingled lands.
- Utilize management techniques that will improve trends occurring to both the vegetative and riparian related resources.

Alternative 1 would discontinue grazing on the allotments and native vegetative conditions would likely improve on National Forest lands within the allotments over time.

Possible Conflicts with Other Land Use Plans, Policies, and Controls

The purpose of the Adaptive Management action is to revise and update the grazing permit and allotment management plan (AMP) in order to comply with the Gallatin Forest Land and Resource Management. The EA is consistent with the Public Law 104-19, Section 504(a), which requires land management agencies to schedule and complete NEPA analyses on all allotments where necessary to support grazing

activities, the Multiple-Use Sustained Yield Act of 1960 that states that National Forests are established for outdoor recreation, range, timber, watershed and wildlife purposes, and the Federal Land Policy and Management Act of 1976, which authorized the Secretary of Agriculture to issue permits for various uses on National Forest Lands. The Adaptive Management Alternative (Alternative 3) and the current management (Alternative 2) also adhere to the legal requirements of. numerous other laws, regulations, and guidelines that are cited on pp. 3-103 through 3-114 of the EA. None of the alternatives have known conflicts with any Land Use Plans, Policies or Controls.

Energy Requirements and Conservation Potential of Alternatives

The energy required to implement any of the alternatives in terms of use of petroleum or energy consuming products is insignificant. Livestock grazing on National Forest Land is an activity that has been ongoing for several decades and does not consume measurable amounts of any type of energy resource.

Probable Adverse Environmental Effects That Cannot Be Avoided

Implementation of the Adaptive Management Alternative (Alternative 3), which would continue grazing opportunities on intermingled National Forest and private land, would not result in adverse environmental effects that cannot be avoided. The proposal incorporates adaptive management direction to address changing livestock management concerns. Alternative 3 has been designed to be responsive to the effects of grazing on the various resources present within the allotment boundaries. Provisions are included to adjust management requirements/strategies to those that are the most responsive to the needs of the resources affected. Continuing to implement current management actions (Alternative 2) may have some adverse effects to stream reaches that are currently not meeting their desired future condition. These stream reaches have been adversely affected by past activities such as logging and recent wildfires. All other riparian areas are in good condition. Alternative 1 would discontinue grazing on the allotments so would not be likely to have avoidable adverse environmental effects.